E1761 02464179 7

ALPINE FIREWEED

BoF
S

UNITED STATES
DEPARTMENT OF THE INTERIOR
HUBERT WORK, SECRETARY
NATIONAL PARK SERVICE
STEPHEN T. MATHER, DIRECTOR

PLANTS
of
GLACIER NATIONAL PARK

By
PAUL C. STANDLEY
ASSOCIATE CURATOR, DIVISION OF PLANTS
U. S. NATIONAL MUSEUM

525898
10 . 8 . 51

GOVERNMENT PRINTING OFFICE
WASHINGTON
1926

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON 25, D. C.
AT

$1.00 PER COPY

CONTENTS

	Page
Introduction	1
List of plants of Glacier Park	5

ILLUSTRATIONS

PLATES

		Page
PLATE I.	Alpine fireweed	Frontispiece
II.	Mountain sorrel	20
III.	Fig. 1.—Carpet pink	40
	Fig. 2.—Harebell	40
IV.	Fig. 1.—Service berry	60
	Fig. 2.—Blue flax	60
	Fig. 3.—Camas	60
	Fig. 4.—Dwarf lupine	60
V.	Fig. 1.—Shrubby cinquefoil	80
	Fig. 2.—Elephant-head	80
	Fig. 3.—Butterwort	80
	Fig. 4.—Red whortleberry	80

TEXT FIGURES

FIG. 1. Holly fern.
2. Oak fern.
3. Bracken.
4. Parsley fern.
5. Fir club moss.
6. Stiff club moss.
7. Western yew.
8. Western larch.
9. Alpine fir.
10. Douglas fir.
11. Western hemlock.
12. Giant cedar.
13. Ground juniper.
14. Cotton grass.
15. Western skunk cabbage.
16. Bear grass.
17. Bog asphodel.
18. Bronze bells.
19. False hellebore.
20. Poison camas.
21. Glacier lily.
FIG. 22. Nodding onion.
23. Mariposa lily.
24. Queencup.
25. False Solomon's seal.
26. Smooth fairy bells.
27. Twisted-stalk.
28. Wake-robin.
29. White bog orchis.
30. Ladies'-tresses.
31. Heartleaf twayblade.
32. Rattlesnake plantain.
33. Coralroot.
34. Mountain alder.
35. Paper birch.
36. Scrub birch.
37. Small bistort.
38. Silver plant.
39. Sulphur plant.
40. Umbrella plant.
41. Alpine spring beauty.
42. Pink spring beauty.

FIG. 43. Bladder campion.
44. Mouse-ear chickweed.
45. Grass sandwort.
46. Northern anemone.
47. Common western anemone.
48. Mountain pasque flower.
49. Meadow rue.
50. Purple clematis.
51. Alpine buttercup.
52. Baneberry.
53. Yellow columbine.
54. Blue larkspur.
55. Globeflower.
56. Oregon grape.
57. Alpine poppy.
58. Wild candytuft.
59. Purple rock cress.
60. Yellow stonecrop.
61. Red stonecrop.
62. Fringed parnassia.
63. Miterwort.
64. Alumroot.
65. Lace flower.
66. Red-stem saxifrage.
67. Bulbous saxifrage.
68. Spotted saxifrage.
69. Meadow saxifrage.
70. Slender saxifrage.
71. Wild gooseberry.
72. Pink meadowsweet.
73. Mountain spray.
74. Prairie cinquefoil.
75. Showy cinquefoil.
76. Alpine cinquefoil.
77. White dryad.
78. Yellow avens.
79. Thimbleberry.
80. Mountain ash.
81. Black hawthorn.
82. Pin cherry.
83. Silky lupine.
84. Pale milk vetch.
85. Slender milk vetch.
86. Hairy loco weed.
87. Yellow hedysarum.
88. White vetchling.
89. Purple geranium.
90. Mountain lover.
91. Buckthorn.
92. Deer brush.
93. Wild hollyhock.
94. Silverberry.
95. Canada buffalo berry.
96. Fireweed.
97. Tall cottonweed.
98. Devil's-club.
99. Cow parsnip.
100. Yellow angelica.
101. Red-osier dogwood.
102. Bunchberry.
103. Pipsissewa.
104. Pink pyrola.
105. One-sided pyrola.
106. Wood nymph.
107. Indian pipe.
108. Menziesia.
109. Bearberry.
110. Red heather.
111. Tall whortleberry.
112. Androsace.
113. Shooting star.
114. Blue gentian.
115. Small gentian.
116. Pink dogbane.
117. Jacob's-ladder.
118. Blue phacelia.
119. Mist maiden.
120. Bur forget-me-not.
121. Heal-all.
122. Horsemint.
123. Yellow beardtongue.
124. Alpine speedwell.
125. Yellow Indian paintbrush.
126. Indian warrior.
127. Alpine lousewort.
128. Northern bedstraw.
129. Highbush cranberry.
130. Snowberry.
131. Twinflower.
132. Black twinberry.
133. Red twinberry.
134. Valerian.
135. False dandelion.
136. Rattlesnake-root
137. White hawkweed.
138. Goldenrod.
139. Smooth aster.
140. Rough aster.
141. Showy fleabane.
142. Pussy toes.
143. Pathfinder.
144. Pearly everlasting.
145. Brown-eyed Susan.
146. Yarrow.
147. Arnica.
148. Arrowhead ragwort.
149. Alpine ragwort.
150. Meadow ragwort.

PLANTS OF GLACIER NATIONAL PARK

By Paul C. Standley

INTRODUCTION

Not the least of the numerous attractions of Glacier Park is to be found in the remarkably varied plant life. The heavy forests are an important factor in the scenic effects, and their aspect is altogether novel to those who are familiar only with the deciduous forests of the Eastern States. The trees of Glacier Park, like those of all the western mountains, are practically all evergreen, and are chiefly pines, firs, spruces, hemlock, and giant cedar. The forests of the west slope are luxuriantly developed and are closely similar to the famous forests of the humid parts of the Pacific coast, although, of course, upon a much smaller scale. They contain many trees which are notable for their great dimensions, and the forest is so dense that it is always pervaded by twilight dimness.

Perhaps even more interesting than the trees are the herbaceous plants, which are represented by a large number of species, a high percentage of them bearing showy flowers. It is rather generally known that flowers are more abundant and more brilliant in mountain regions than in less favored localities of low elevation. The Rocky Mountains are noted for the flower fields of their upland meadows, and in this respect no portion of the Rockies is better furnished than Glacier Park. Everywhere in the park—in the heavy forest as well as in open places, but more particularly in the meadows above or about timber line—there are wonderful displays of color throughout the summer. The growing season is very short, especially at high altitudes, compelling the plants to take advantage of every day if they are to perfect their fruit, and consequently all seem to burst into flower at once. The plants are retarded by the slow-melting snow banks, but the flowers follow quickly upon the retreating snow, and sometimes may be found pushing up their blossoms through its thin edges. In sheltered nooks the snow lies so late that the plants are able to bloom only at the end of summer, after most others of their species have developed their fruit, and in this way the alpine meadows are kept continuously provided with flowers, even until snow falls at the end of summer. At low altitudes plants have

different blooming periods, just as they do in less elevated regions, and here there are charactistic spring, summer, and autumn flowers.

Long after their flowers have withered many plants become again conspicuous with the ripening of their fruit. Some plants which are inconspicuous in flower are very handsome in fruit, and others are equally attractive at either stage. Several of the plants bear edible fruit, notably the whortleberries, service berries, raspberries, and strawberries. In this connection it may be stated that there are no plants in the park that are poisonous to the touch, and it is safe to eat, in small quantity, at least, any of the fruits that are agreeable to the taste.

In general, the flora of Glacier Park is like that of the central Rocky Mountain region, but the Continental Divide, which traverses the park, has a marked effect upon plant distribution, as is well shown in the case of the trees. The trees of the east slope are all typical Rocky Mountain species, but on the west slope we find, in addition, yellow and white pine, larch, giant cedar, hemlock, and great silver fir, all of which are Pacific coast species, most of them reaching here the eastern limit of their range. In the case of the herbaceous plants much the same condition is found, and it is thus evident that the flora of the west slope shows a marked relationship to that of the Pacific coast. A large number of plants are found only on the west slope of the park, but apparently only a few species, except those characteristic of the plains, are confined to the east slope. Many of the Rocky Mountain plants are quite unlike any of those found in the East, but there is a small proportion of species which are common to the two regions. In many cases plants of the East and West, which to the casual observer appear identical, would be found to possess clearly defined differences if placed side by side.

It is evident even to a careless observer that the vegetation of the park is not uniform at all altitudes, and it can be recognized, especially on the east slope, as divisible into four rather well-marked belts or zones. These are the following: (1) The plains and foothill region, where there are no trees, and only a few shrubs, but many kinds of herbaceous plants; (2) the timber belt, which covers the largest area of the park, and is indicated by a heavy growth of trees (open meadows are frequent among the trees), with an undergrowth of many kinds of shrubby and herbaceous plants; (3) the timber-line belt, an ill-defined zone transitional between the heavy forest and the alpine meadows, with a thin growth of small trees (chiefly white-bark pine and alpine fir) and shrubs, and with extensive meadows filled with bright-flowered herbaceous plants; and (4) the alpine belt, which includes all the slopes above the last remnants

of trees, an area of meadows and rock slides, the plants of which consist of a few low shrubs and of numerous kinds of small herbs. Some plants range through nearly all these belts, but many are found in only a single one. On the west slope the lowest belt, the plains and foothill region, is not represented except along the North Fork of the Flathead River, a locality infrequently seen by visitors.

Each of these belts exhibits certain unique features. To most persons the plants of the alpine region are perhaps most entertaining, for there is here the greatest profusion of flowers. Many of the alpine plants have a wide distribution, not only in North America but in Europe and Asia as well. The timber belt is of greatest interest because of the trees, but the herbaceous plants also are often very showy, and more ferns grow here than elsewhere. No one who is interested in plants should fail to visit the sphagnum bogs about Fish and Johns Lakes (near Lake McDonald), for many of the plants of sphagnum bogs are not found elsewhere in the park. A locality near Many Glacier Hotel which yields a large number of plants that are rare elsewhere is the swamp along Swiftcurrent Creek in the horse pasture below the lake. The plants of the plains can be seen most easily at the east entrance or at St. Mary. A large proportion of the prairie flowers are never seen in the mountains.

This publication, **The Plants of Glacier Park,** is based upon field work by the author during the summer of 1919. All the parts of the park commonly seen by tourists were visited and a large collection of plants was obtained. These collections represent over 900 species of flowering plants and ferns, and when the region has been thoroughly explored botanically it will doubtless be found that the total number of species growing here is well above a thousand. It is evidently impracticable to list and describe all these plants in a work which is intended for popular use. Many of the species are grasses and sedges, in which most persons take little interest, and many others are inconspicuous and weed-like and of no interest except to botanists. In other groups, such as the Indian paintbrushes, there are numerous species, but these are all so much alike that only the professional botanist is concerned with their differences. It has therefore been the writer's aim to list only the more conspicuous and interesting plants, depending chiefly upon the illustrations for identification, and giving only such brief descriptive notes as are necessary to supplement them. It has been the intention also to use as few technical terms as possible. No attempt has been made to include all the prairie plants found about the east entrance, a locality outside the actual park boundaries. By the use of the present publication it should be possible for anyone, even if quite unfamiliar with botanical technicalities, to name all of the common plants of the park.

The only technical work in which all the plants of the region are described is the "Flora of the Rocky Mountains and Adjacent Plains," by P. A. Rydberg. "A New Manual of Botany of the Central Rocky Mountains," by J. M. Coulter and Aven Nelson, also describes a large proportion of the species. Among popular works the "Alpine Flora of the Canadian Rocky Mountains," by Stewardson Brown, will be found useful.

In the following list the plants are arranged by families (groups of related species) in the order generally followed by botanists, beginning with the less highly specialized groups. The lowest plants, including the mosses, liverworts, lichens, mushrooms, etc., of which a very large number are found in the park, are not included in the present treatment.

For assistance in the field work upon which this bulletin is based the writer is under special obligations to Mr. W. W. Payne, former superintendent of Glacier Park, and to all the park employees; also to the proprietors and employees of the Glacier Park Hotel Co. and Glacier Park Transportation Co.; and to Mr. J. E. Lewis, of the Glacier Hotel. Acknowledgments are due to Mrs. William Warren, Mr. Robert B. Rockwell, Mr. E. R. Warren, and Dr. E. T. Wherry, who have furnished photographs from which some of the text figures were made. The water-color sketches from which the colored plates were reproduced are by the late Mr. F. A. Walpole, of the U. S. Department of Agriculture.

LIST OF PLANTS OF GLACIER NATIONAL PARK

POLYPODY FAMILY. POLYPODIACEAE

Ferns are abundant in the park and are found at all altitudes. They are distinguished from each other chiefly by their fruit, which is borne on the underside of the leaf or frond. The spores, which correspond to the seeds of higher plants, are inclosed in minute spore cases or *sporangia* (somewhat similar to seed pods), which are arranged along the underside of the leaf at its edge or, more commonly, are in dotlike clusters (*sori*) scattered over the lower side of the leaf. The fruit dots are naked, or else they have a thin, membrane-like covering, known as the *indusium*. The leaves are simple and variously lobed, or else they are compound—that is, composed of numerous divisions (*pinnae*) which resemble the leaflets of the compound leaves of the higher plants. Besides the ferns listed below, which are the most common species, the following additional ones grow in the park: **Brittle fern** (*Filix fragilis;* known also as *Cystopteris fragilis*); two kinds of **woodsia** (*Woodsia scopulina* and *W. oregana*); **bristle fern** (*Polystichum andersoni*); **crested shield fern** (*Dryopteris cristata*); **wood fern** (*Dryopteris dilatata*); **green spleenwort** (*Asplenium viride*); **cliff brake** (*Cryptogramma stelleri*); **lace fern** (*Cheilanthes gracillima*); **pod fern** (*Cheilanthes siliquosa*). Two kinds of **grape fern** (*Botrychium virginianum europaeum* and *B. silaifolium*) and **moonwort** (*Botrychium lunaria*), of the closely related Adder's-tongue Family, grow in the park.

Holly fern (*Polystichum lonchitis*). (Fig. 1.)—Common in woods and thickets; often growing under shrubs above timber line. Leaves 4 to 12 inches long or even larger, thick and firm, evergreen, the stalks covered with large, light-brown scales; pinnae with numerous fine, spinelike teeth; fruit dots large, covered by a thin indusium which is attached by its middle. The holly fern somewhat resembles the Christmas fern (*Polystichum acrostichoides*) of the Eastern States. Although it is found all through the wooded portions of the park, it is seldom abundant.

Oak fern (*Dryopteris linnaeana*[1]). (Fig. 2.)—Abundant in moist woods. Leaves triangular, 4 to 8 inches broad, thin and soft, on very slender stalks; fruit dots small, without an indusium. Easily

[1] The name *Phegopteris dryopteris* is used in some books.

recognized by the form of the leaves (shown in the illustration), and by the slender habit. One of the most common and most attractive ferns of the park, frequently forming great mats over mossy banks. The oak fern ranges across North America and is found also in Europe and Asia.

Male fern (*Dryopteris filix-mas*).—Common in deep, moist woods. Leaves 1½ to 3 feet long, dark green, rather thick and firm; pinnae deeply lobed; leaf stalk covered with large, chafflike scales; fruit dots large, rounded, covered at first by an indusium which is kidney shaped and attached to the leaf by its edge rather than by its center. In general appearance the male fern somewhat resembles the lady

FIG. 1.—Holly fern

FIG. 2.—Oak fern

fern, with which it usually grows, but the lady fern has narrow, curved fruit dots. The male fern is found in many parts of North America and in Europe and Asia.

Lady fern (*Athyrium filix-foemina*[2]).—Abundant everywhere in woods. Leaves 1 to 4 feet long, thin, slender-stalked; pinnae divided to the midrib into small lobes which are again lobed or toothed; fruit dots covered with an indusium which is very narrow and curved, often horseshoe shaped. This is by far the most abundant fern of the park, and there are probably a hundred times as many plants of it as of any other species. It often forms dense tangles of leaves which are so extensive that they become a nuisance if one is trying to walk through them. The lady fern would be much

[2] The name *Asplenium filix-foemina* is used in some books.

more admired if it were less abundant. This species is widely distributed in North America, Europe, and Asia.

Maidenhair (*Adiantum pedatum aleuticum*).—In crevices of cliffs above timber line; scarce, but found at Cracker Lake, along the trail near Iceberg Lake, and in similar localities. One of the best known of North American ferns and scarcely needing description. In Glacier Park the leaves are only 4 to 8 inches wide, but in other places they are often much larger. The form of the leaves is distinctive, also the slender, wiry, smooth, purplish brown leaf stalks. Our plant is the western maidenhair, but it differs very little from the common eastern plant.

Bracken (*Pteridium aquilinum*[3]). (Fig. 3.)—Common at low and middle altitudes, in open places, or in woods. A coarse plant with leathery, much divided leaves; some plants in the park, in wet places, are nearly 6 feet high, but usually they are only 1½ to 3 feet high. The leaves grow one in a place, never clustered like those of the lady fern. The spores are borne along the edges of the leaves. Bracken is one of the most widely distributed ferns, being found almost all over the globe.

FIG. 3.—Bracken

Parsley fern (*Cryptogramma acrostichoides*). (Fig. 4.)—Common on rock slides and cliffs. The common name is a very descriptive one. The plants usually form dense tufts about 6 inches high. The fertile leaves are very different from the sterile ones, and have very narrow leaflets. The spores are borne on the under surface of the leaflets, whose margins are inrolled so as partially to cover them. The parsley fern is common in the Rocky Mountains and extends westward to the Pacific coast.

Western polypody (*Polypodium hesperium*).—Occasional at low and middle altitudes, on exposed or shaded rocks. Leaves 3 to 8 inches long, slender-stalked; fruit dots large, rounded, without an indusium. The leaves are different from those of any of our other ferns; they are lobed nearly to the midrib, while in all our other ferns the leaves are lobed quite to the midrib; the lobes of the leaves

[3] In some books the name *Pteris aquilina* is used.

are not toothed as they are in our other species. The rootstocks are sweet and have a flavor like that of licorice. This is a species which is found only in the West, but it is much like the common eastern polypody (*Polypodium vulgare*).

CLUB MOSS FAMILY. LYCOPODIACEAE

Our species of this family are low plants which usually have branched stems; the leaves resemble those of cedars or firs. The spores, which correspond to seeds, are borne either in the axils of ordinary leaves or in club-shaped fruiting spikes, formed of leaves which are very different from those of the sterile branches. They are interesting plants and the species are easy to separate. Only one species is common on the east slope of the park.

FIG. 4.—Parsley fern

FIG. 5.—Fir club moss

Fir club moss (*Lycopodium selago*). (Fig. 5.)—Under bushes about Sperry Glacier and Gunsight Pass; in sphagnum bog at Johns Lake. Plants erect, stiff, 3 to 6 inches high, with few branches; leaves pressed loosely against the stem or sometimes spreading. This is the only one of our species which has the spores in the axils of the leaves; in all the others they are in slender, yellowish, club-shaped spikes. The plants are much stouter and stiffer than in the other species, and they never trail over the ground.

Ground pine (*Lycopodium obscurum*).—In deep woods, on moss, at the foot of Lake McDonald. Plants 4 to 10 inches high, bushy, resembling a little tree, dark green; leaves loose, not appressed to the stem; fruit spikes not stalked.

Stiff club moss (*Lycopodium annotinum*). (Fig. 6.)—Common in moist woods. Stems running over the ground and forming mats, sending up erect, simple or branched stems 4 to 10 inches high; leaves dark green, loose and spreading; fruit spikes not stalked. This is the only species which is common on both slopes of the park. On the west slope it is seen more frequently than any other species. The creeping stems are often several feet long.

Ground cedar (*Lycopodium complanatum*).—Common on the west slope in moist woods. Stems long and creeping, sending up erect, bushy, tree-like branches 3 to 6 inches high; branches pale yellowish green, flattened, covered with small leaves which are pressed very closely against the stems; fruit spikes on long stalks.

Alpine ground cedar (*Lycopodium alpinum*).—Under bushes at Snyder Lake, and probably elsewhere at higher altitudes. Similar in appearance to the ground cedar, but pale blue-green; fruit spikes not stalked. The branches look very much like those of creeping cedar (*Juniperus horizontalis*).

Running pine (*Lycopodium clavatum.*)—Under bushes about Johns Lake; abundant in this one locality. Stems long, creeping over the ground, sending up erect, branched stems a few inches high; leaves long, soft, loose, not appressed to the stem; fruit spikes on slender stalks.

FIG. 6.—Stiff club moss

HORSETAIL FAMILY. EQUISETACEAE

Ten species of **horsetail** or **scouring rush** (species of the genus *Equisetum*) grow in the park. They are leafless plants with rough, round or ridged stems which are branched or unbranched; if branched, the slender branches are in whorls; the leaves are reduced to scales, which are borne in rings around the stem; the spores (corresponding to seeds) are borne in a little cone at the top of the stem. The species can not be distinguished from each other easily, and the plants are of little general interest.

YEW FAMILY. TAXACEAE

Western yew (*Taxus brevifolia*). (Fig. 7.)—Abundant in deep woods on the west slope. A shrub, 5 to 20 feet high, usually

branched from the base; bark purplish; leaves deep yellowish green, half to three-fourths of an inch long; fruit bright red, juicy, one-seeded. The leaves resemble those of the firs but are sharp-pointed. The fruit, of course, serves to distinguish the plant. The fruit has a rather insipid, sweetish flavor. The yew forms most of the brushy undergrowth in the heavy forest of the west slope of the park.

PINE FAMILY. PINACEAE

The trees and shrubs of this family are known popularly as "evergreens." They are the most important plants of Glacier National Park, for practically all the forest is composed of evergreen trees. This is also the case in all the forests of the West, but in the East, with some notable exceptions, the forests are composed chiefly of broad-leaved trees.

FIG. 7.—Western yew

The following key is presented here for use in separating the plants of this family. The firs, spruces, and hemlocks, which many people find so difficult to distinguish, are easily separated by their cones, but these, unfortunately, are usually borne only at the tops of the trees, where it is impossible to see them.

Leaves very small and scale-like (like those of common cedar), usually less than a quarter of an inch long (sometimes half an inch in creeping juniper); fruit small, half an inch long or shorter, a dry cone or a bluish, berry-like cone.

Plants large trees; branches flattened and fern-like; fruit a brown cone, about half an inch long, with few large scales.

Giant cedar (p. 16).

Plants low shrubs, often creeping, or small trees, the branches not flattened; fruit a small, bluish, berry-like cone.

Leaves a fourth to half an inch long, sharp-pointed, spreading from the branchlets; a low shrub, 1 to 3 feet high.

Ground juniper (p. 16).

Leaves less than an eighth of an inch long, blunt, pressed closely against the branchlets.

Plant a small creeping shrub. **Creeping cedar** (p. 17).

Plant a large, erect shrub or small tree.

Western red cedar (p. 17).

Leaves needle-like, most of them half an inch long or often much longer; fruit a large cone, half an inch to 10 inches long.

Leaves in clusters of 2 or more, not flattened.

Clusters of leaves not surrounded at the base by a sheath; leaves deciduous, soft, very numerous (12 to 40) in each cluster; cones small, 1 to 2 inches long, with long, needle-like bracts protruding from between the scales.

Bark of the trunk 3 to 6 inches thick, deeply furrowed; young twigs nearly smooth; a large tree of low altitudes.
Western larch (p. 13).

Bark half to three-fourths of an inch thick, only slightly furrowed; twigs hairy; a small tree, found only near timber line. **Alpine larch** (p. 14).

Clusters of leaves surrounded at the base by a thin, brown sheath; leaves evergreen, stiff, few (2 to 5) in each cluster; cones usually large, 1½ to 10 inches long, never with protruding, needle-like bracts.

Leaves in clusters of 2 or 3.

Leaves 1½ to 2½ inches long, usually in clusters of 2; cones small, about 1½ inches long. **Lodgepole pine** (p. 12).

Leaves 4 to 10 inches long, usually in clusters of 3; cones large, 4 to 10 inches long. **Western yellow pine** (p. 12).

Leaves in clusters of 5.

Bark white; a low stunted tree or shrub, found only about timber line; cones 1½ to 3 inches long; leaves 1¼ to 2½ inches long. **White-bark pine** (p. 13).

Bark brown or blackish; usually large trees, most common far below timber line; cones 3 to 10 inches long.

Tree very tall and slender, with a small top; cones narrow, several times as long as thick, 6 to 10 inches long; leaves 2 to 4 inches long.
Western white pine (p. 13).

Tree low, with a heavy trunk and large top; cones thick, only about twice as long as broad, mostly 3 to 8 inches long; leaves 1½ to 2½ inches long.
Limber pine (p. 13).

Leaves never clustered, inserted singly on the branches, often flattened.

Leaves sharp-pointed, not flattened, 4-cornered or rounded in cross section; cones drooping on the branches, borne only at the top of the tree; bark rough; twigs from which the leaves have fallen rough with wartlike projections.

Twigs finely hairy. **Engelmann spruce** (p. 16).

Twigs not hairy. **White spruce** (p. 16).

Leaves blunt-pointed, flat.

Trunk bark smooth, with numerous blisters filled with liquid resin; cones erect, borne at the top of the tree, 2 to 4 inches long, falling apart easily.

Leaves of the lowest branches arranged in two rows (on two sides of the twigs), mostly notched at the end. **Great silver fir** (p. 14).

Leaves of the lower branches more or less crowded on the upper side of the twigs, not notched at the end. **Alpine fir** (p. 14).

Trunk bark very rough, without blisters; cones drooping, half an inch to 4 inches long, not falling apart, even when old.

Leaves averaging about half an inch long, contracted at the base into a short stalk; cones three-fourths to 1¼ inches long, without protruding bracts. **Western hemlock** (p. 15).

Leaves averaging about an inch long, not stalked; cones 2 to 4 inches long, with conspicuous, protruding, 3-lobed bracts. **Douglas fir** (p. 15).

Western yellow pine (*Pinus ponderosa*).—Scattered trees are found about Belton and Lake McDonald, and the species is more common in the low land along the North Fork of the Flathead River. Easily recognized by the very long (4 to 10 inches) leaves, in clusters of 3. A large tree with a tall, heavy trunk, covered with large, reddish plates; top usually large but narrow. The western yellow pine is one of the most abundant of western trees, and its scarcity in Glacier Park is due only to the fact that most of the region is too elevated to be suitable for its growth. It is one of the most important lumber trees of the West.

Lodgepole pine (*Pinus contorta*).—Abundant on the east slope at low and middle altitudes; less common on the west slope. Marked by the short leaves (1½ to 2½ inches long), in bundles of 2. One striking feature of this species is found in the small cones, which often remain on the tree for several years. A medium-sized tree (sometimes very large), with scaly, grayish brown bark and rounded top. It is the most abundant tree on the east slope at low altitudes, where it often forms pure stands, and it is also mixed with spruce and Douglas fir at middle altitudes. On the west slope the trees are scattered through the mixed forest. The tall, slender trunks sway so in the wind that it gives one a decidedly unsafe feeling to walk among them. Very frequently they do topple over, to lodge against other trees, a fact which has suggested to many the name "lodgepole." The name originated, however, from the use of the long,

slender stems of saplings by Indians for lodge poles. This pine springs up quickly in burned areas, and in such places the young trees form dense thickets. Anyone who attempts to penetrate the "burns" on the east slope, which are tangled piles of weathered logs and masses of lodgepole pine saplings, will never afterwards have a favorable impression of the tree. It really gives one the impression of being rather a noxious weed than a tree, yet it serves a most useful purpose in reforesting the mountain sides. Some of the large, isolated individuals are very fine trees. Lodgepole pine is one of the common trees of the Rockies and is found also on the Pacific coast.

White-bark pine (*Pinus albicaulis*).—One of the most common trees about timber line; often only a shrub. Conspicuous because of its white bark, which suggests that of alpine fir, with which it grows. It is rarely more than 25 feet high. The cones remain closed at maturity, while in the other related pines they open and discharge their seeds.

Western white pine (*Pinus monticola*).—Common on the west slope at low and middle altitudes, but rare or absent on the east slope. This is the finest of all the pines of the park, many of the slender, slightly tapering trunks being 100 feet high. The trunk is covered with brown or grayish-purple bark, which is broken into small, square blocks; the crown is narrow and usually not very long.

Limber pine (*Pinus flexilis*).—Frequent on the east slope in open, exposed places; occasional on the west slope near timber line. A low tree, 25 to 50 feet high, with a short, heavy trunk, covered with blackish or dark brown bark, which is furrowed and broken into large blocks; the crown is broad and large. On some of the rocky slopes this forms small groves, but it is usually scattered among other trees. The largest individuals seen by the writer were at Granite Park. In exposed places the trees are often very crooked, and frequently they are conspicuously lopsided. This pine, which is often known in the West as white pine, is widely distributed in the Rocky Mountain region.

Western larch (*Larix occidentalis*). (Fig. 8.)—Often known as tamarack. Abundant on the west slope at low and middle altitudes. A fine tree, often over 100 feet high, with a clean, slightly tapering trunk and a short, narrow, pointed top; bark bright reddish brown, deeply furrowed near the base of the trunk, but only slightly furrowed above. The leaves resemble those of a pine in being needle-like, but they are shorter, have no sheaths around their bases, and occur clustered on dwarf branchlets. In autumn they turn bright yellow and fall from the tree. Soon after passing westward from Summit, on the Great Northern Railroad, the larch becomes a conspicuous feature of the landscape. About Belton it is the most

abundant tree, and it is one of the chief components of the forest about Lake McDonald. The larch reseeds burned or cut-over areas rapidly, and the young trees form dense thickets which are quite as difficult and disagreeable to penetrate as those of lodgepole pine. The wood is valuable for lumber.

Alpine larch (*Larix lyallii*).—Rare, but said to be found in some places about timber line. A small, stunted tree, distinguished from the western larch by the very woolly young twigs.

Alpine fir (*Abies lasiocarpa*). (Fig. 9.)—Common about timber line and frequent also at much lower altitudes. About timber line it is a small tree or a stunted shrub, often spreading over the ground; but at lower levels it develops into a fine, large tree with a short

FIG. 8.—Western larch

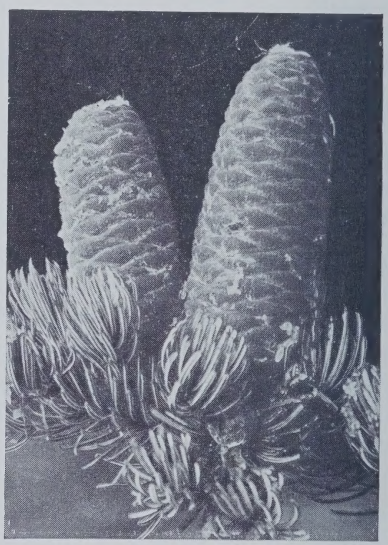

FIG. 9.—Alpine fir. Photograph by A. H. Barnes

trunk and long, narrow, pointed crown. In heavy timber the trunks are easily distinguished from those of other evergreen trees by their smooth, pale gray bark. The cones are beautifully colored with purple. The firs are our only evergreen trees (except the white-bark pine) which have smooth bark. The cones of the firs, too, differ from those of the other evergreen trees in standing erect, like candles on a Christmas tree, and unlike those of other evergreens they fall apart on the trees at maturity.

Great silver fir (*Abies grandis*).—Often known as white fir. Occasional at low altitudes on the west slope, but not very common. A fine, large tree, similar to the alpine fir but usually much larger, and found at lower altitudes. Bark smooth, ashy brown, on old trees shallowly furrowed; cones light yellow-green.

Douglas fir (*Pseudotsuga mucronata*). (Fig. 10.)—Known also as red fir and Douglas spruce. Common in the forests of both slopes. Near timber line it is low and stunted, shrubs only 5 or 6 feet high being sometimes loaded with cones; but usually the Douglas fir is a tall tree. It is the largest tree of the United States, excepting only the giant sequoias of California, but the trees in Glacier Park do not attain nearly the size of those which grow in the humid regions of the Pacific coast. The trunks are tall and heavy, covered with dark brown, deeply ridged and furrowed bark. The crown is pyramidal and sharp pointed, or sometimes broad and rounded; the lower branches are usually drooping, and they have slender, often very long, pendent side branchlets. The cones are distinctive

FIG. 10.—Douglas fir

FIG. 11.—Western hemlock

and quite different from those of our other evergreen trees, and they are scattered all over the tree, while in the spruces and true firs they are borne only at the top of the tree. Douglas fir is the most important lumber tree of the United States.

Western hemlock (*Tsuga heterophylla*). (Fig. 11.)—Abundant on the west slope at low altitudes. A large tree with gradually tapering trunk, covered with dark brown, somewhat reddish, ridged bark. The crown is usually narrow and pointed and the branches have numerous graceful, drooping branchlets. The leaves are thin and whitish on the under side; they are shorter (half an inch long) than in the firs and spruces. Young trees and seedlings are very abundant in the dense forest, growing with yews. The hemlock found in the Eastern States is a different but very similar species.

Engelmann spruce (*Picea engelmannii*).—Common at middle elevations. A large tree with a clean, slightly tapering trunk, and a narrowly pyramidal crown composed of short branches; bark dark purplish brown, composed of small, loose scales; foliage bluish green or dark green; cones light or dark brown, drooping. The spruces are easily distinguished from the firs and from the Douglas fir by their stiff, sharp-pointed, four-sided leaves. The cones do not stand erect as in firs, nor do their scales fall apart.

White spruce (*Picea canadensis*).—Occasional with the Engelmann spruce; distinguished by having smooth rather than hairy twigs.

Giant cedar (*Thuja plicata*). (Fig. 12.)—Abundant on the west slope at low altitudes; a few scattered trees occur on the east slope.

FIG. 12.—Giant cedar

FIG. 13.—Ground juniper

The finest tree of the park, easily distinguished by the reddish brown bark, which can be torn into long shreds or strips. The lower branches are drooping and have a graceful, fernlike appearance. The dense stand of giant cedar about the head of Lake McDonald is one of the finest and most imposing sights of the park. The tree, which is common on the Pacific coast, reaches the eastern limit of its range here. The wood is very light in weight and is much used for lumber. The arbor vitae, which is common in cultivation, is a closely related species of the eastern United States.

Ground juniper (*Juniperus sibirica*). (Fig. 13.)—Common at nearly all altitudes, usually in open places. A shrub, sometimes 3 feet high, but more often prostrate or nearly so, commonly forming

broad clumps or mats; leaves very sharp pointed, with a whitish stripe on the upper side; fruit dark blue.

Western red cedar (*Juniperus scopulorum*).—On rocky banks at Belton and probably elsewhere. A small tree or shrub, very much like the common red cedar of the East.

Creeping cedar (*Juniperus horizontalis.*)—Common on the east slope in open places, especially at low altitudes. Resembling the common red cedar, but the plants scarcely 6 inches high, the branches lying flat along the ground. Very abundant on flats about St. Mary and at the east entrance; also on slopes about Many Glacier Hotel. The plants form large, bright green or bluish green mats.

PONDWEED FAMILY. POTAMOGETONACEAE

Several species of **pondweed** of the genus *Potamogeton* occur in the park. They are found in the warmer lakes of the west slope, in St. Mary and Lower St. Mary Lakes, in the slower parts of streams, and in other similar locations. They seem to be absent from the colder lakes. The plants are attached to the bottom of lakes or streams; some of them reach the surface and have broad floating leaves, while other species are wholly submerged. They have very small, greenish flowers arranged in spikes.

GRASS FAMILY. POACEAE

Eighty or more species of grasses occur in Glacier Park. They receive little attention from visitors, however, and the species are very difficult to distinguish; consequently no attempt is made to list them here. Perhaps the most easily recognized of our grasses is the **common timothy** (*Phleum pratense*), a native of Europe, which has become widely distributed in the park. There is also a **mountain timothy** (*Phleum alpinum*), with shorter flower spikes, which is an abundant grass in subalpine meadows.

SEDGE FAMILY. CYPERACEAE

The sedges form one of the largest groups of the plants of the world, and they are represented in Glacier Park by 60 or 70 species. Most visitors, however, take no interest in them and generally refer to them as grasses. The species are very difficult of separation. Most of the grass-like vegetation of the meadows above timber line is composed of different kinds of sedges (especially of those of the genus *Carex*).

Cotton grass (*Eriophorum chamissonis*). (Fig. 14.)—Of rather rare occurrence on both slopes; abundant in a wet meadow below Lake McDermott; also in sphagnum bogs on the west slope. A

grass-like plant, about a foot high, very conspicuous in fruit because of the large, graceful, cotton-like heads.

ARUM FAMILY. ARACEAE

Western skunk cabbage (*Lysichiton kamtschatcensis*). (Fig. 15.)—Of occasional occurrence on the west slope, in dark, brushy or wooded swamps. A fleshy plant with thick, heavy rootstocks; leaves 1 to 2 feet long; fruit a large club-like cluster of bright red berries. The "flower" of this plant is somewhat like that of the calla, which belongs to the same family. The flowers are really very small and green and crowded on a long thick stalk called the spadix; this spadix is surrounded by a yellow spathe (4 to 6 inches long) which resembles a corolla. The root of this plant, like that of the Indian turnip, is very acrid or "hot," because of the presence of needle-like crystals of calcium oxalate, which penetrate the tongue when a piece is chewed and cause temporary swelling. In the West the false hellebore (*Veratrum;* see p. 20) is often, but erroneously, called skunk cabbage.

FIG. 14.—Cotton grass

LILY FAMILY. LILIACEAE

Many of the most interesting and attractive plants of the park belong to this family. The lily, hyacinth, yucca, asparagus, lily of the valley, tulip, and a host of other cultivated plants are members of the group.

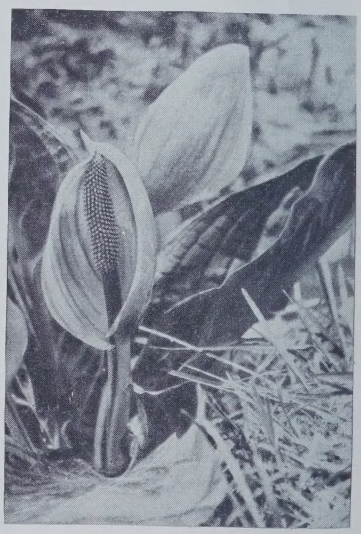

FIG. 15.—Western skunk cabbage

Bear grass (*Xerophyllum tenax*). (Fig. 16.)—Of all the herbaceous plants of the park this is doubtless the most conspicuous, and no other one attracts so much attention. It is found nearly everywhere, but it is most abundant in thin woods or subalpine meadows. At lower levels it begins flowering in June, and as the season advances the plants higher up come into blossom. In August most of them have

finished their blooming period, but patches in full flower may still be found in sheltered spots from which the snow has lately melted. The 1st of September, 1919, a small field of the plants was a striking feature of the landscape on a slope along the trail just below Sperry Chalets, and some of the plants were doubtless still in flower when snow fell. The bear grass, of course, is not a grass, but the leaves are grass-like; they are pale on the under surface, and their edges are so sharp that they cut one's hands if an attempt is made to pull the plant up. Sterile plants often form a close sward on steep slopes, and the matted leaves are so slippery that it is all but impossible to climb over them. The tall flower stalks are cut down by ground squirrels for food. The leaves are used by some of the northwestern Indians for making fine baskets, hence the name basket grass, which is sometimes applied to the plant. It is known also as bear-paw and squaw grass. There is no apparent reason for the application of the name bear grass to this plant. The statement is sometimes made that bears dig and eat the roots, but this is doubtful, since the plant does not have a bulb, as some suppose, but a hard, woody rootstock. The species of bear grass found in Glacier Park does not extend eastward, but it is common farther west and is a conspicuous feature of the vegetation of Mount Rainier. There is only one other species of the genus; it is found in pine barrens along the Atlantic coast, from New Jersey to Florida, and is known as turkey beard. It is said, and probably correctly, that some seasons very few bear grass plants flower, while in other years nearly all the plants produce flower stalks. The flowers have a pronounced odor which by some persons is considered unpleasant.

FIG. 16.—Bear grass

Bog asphodel (*Tofieldia intermedia*). (Fig. 17.)—Common or abundant in alpine meadows, especially along brooks; found locally, also, at lower levels in bogs, especially in sphagnum. Plants a foot

high or less, the leafy stem covered with sticky glands; leaves 2-ranked, like those of an iris or flag; flowers small, yellowish white; fruit capsule 3-celled, nearly always dark red. This abundant plant of high meadows is particularly attractive when in fruit. Under unfavorable conditions the plants sometimes flower when only 1 or 2 inches high. Another species of bog asphodel (*Tofieldia palustris*) grows in wet places on the east side of Gunsight Pass; it is only 2 to 6 inches high, and the more slender stem is leafless and smooth.

Bronze bells (*Stenanthium occidentale*). (Fig. 18.)—At nearly all altitudes, but rarely abundant; found on open hillsides about the east entrance, in spruce woods at middle elevations, and most commonly in subalpine meadows, especially under and about shrubbery.

FIG. 17.—Bog asphodel. Flowers white

FIG. 18.—Bronze bells. Flowers green or bronze

Plants usually a foot high or less, rising from a small bulb; leaves smooth, on luxuriant plants nearly an inch wide but usually much narrower; flowers about a third of an inch long, green, brownish, or purplish, with a characteristic spicy fragrance. The plant reaches the eastern limit of its range in the park. Because of the greenish flowers, it is never a conspicuous feature of the vegetation.

False hellebore (*Veratrum viride*). (Fig. 19).—Common in all the wooded portions of the park and sometimes occurring in open places. A coarse plant, 3 to 5 feet high, with broad, parallel-veined leaves; flowers green, a third of an inch long. False hellebore is abundant in the woods in many places and is a conspicuous plant. In 1919 very few plants were found in flower, perhaps on account

MOUNTAIN SORREL

of the dryness of the season. In the West this and other species of *Veratrum* are often called skunk cabbage, but they are very unlike either the eastern or the western skunk cabbage (see p. 18). The powdered roots of some of the false hellebores are used in making insect powder. The drug hellebore comes from a European plant of the Buttercup Family. It is said that in spring the young shoots of false hellebore are sometimes eaten by cattle and sheep, with fatal results.

Poison camas (*Zygadenus elegans*). (Fig. 20.)—Frequent on the east slope at nearly all altitudes; in aspen thickets, in spruce woods, on open slopes, and in alpine meadows; rare on the west slope. Plants 5 inches to 2 feet high, from large bulbs, often growing in clumps; leaves smooth, a sixth to half an inch wide; flowers yellowish or greenish white, about half an inch broad. At low altitudes the plants are tall and have leafy flower stems, but in alpine places they are low and the stems are often leafless. Poison camas is poisonous to stock.

FIG. 19.—False hellebore. Flowers green. Photograph by Asahel Curtis

Glacier lily (*Erythronium grandiflorum*). (Fig. 21).—Common at nearly all altitudes on the east slope; on the west slope rarely found except at high altitudes. This plant is too well known in the park to need description. In spring the flowers are abundant everywhere at low altitudes, but by the time the tourist season opens the only plants left in flower are those growing in alpine meadows and about snow banks. In such places the plants often form great continuous sheets of bright yellow, which are one of the finest floral features of the park. The best display of the glacier lily, perhaps, is at Iceberg Lake, but there are showy fields elsewhere. The plants spring up as soon as the snow leaves the ground, and they may often be seen thrusting through thin snow about the large banks. The

flowers vary from one to five on each plant. The glacier lily is related to the dog-tooth violet or adder-tongue of the Eastern States, but the latter has spotted leaves and much smaller flowers. The avalanche lily of Mount Rainier is a white-flowered species; it does not grow in Montana. The bulbs are eaten by bears, and at high altitudes one often finds the sod overturned by the animals in their search for this food.

Purple onion (*Allium sibiricum*).—Common in alpine meadows and on high brushy slopes; often found on lake shores and in low meadows near lakes. A very handsome plant, with large erect clusters of rosy purple flowers, which last a very long time. The leaves are hollow like those of the garden onion. The bulbs have a very "hot" flavor, much more intense than in the next species.

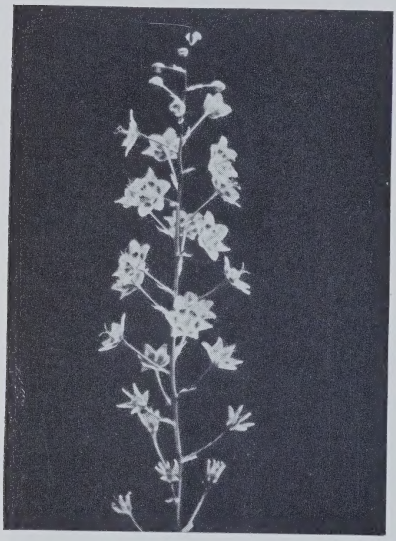

FIG. 20.—Poison camas. Flowers yellowish white. Photograph by Albert Haanstad, Denver, Colo.

Nodding onion (*Allium cernuum*). (Fig. 22.)—Frequent at nearly all altitudes; in aspen thickets near both entrances, on open or brushy slopes, in meadows, and on rock slides. Easily recognized by its onion odor and flavor. The cluster of pale or bright pink flowers is recurved. The leaves are not hollow as in the purple onion.

Mariposa lily (*Calochortus elegans*). (Fig. 23.)—Of frequent occurrence at nearly all altitudes, usually in meadows or thickets. This handsome little plant may be easily recognized from the illustration. It is never very conspicuous when growing, for it is commonly half hidden by grasses or other plants. The flowers are about an inch and a half wide, white, and often faintly tinged with purple. Mariposa or butterfly lilies are most abundant in California, where there are many species of them with variously colored flowers.

Camas (*Quamasia quamash*). (Pl. IV, fig. 3.)—Common at low altitudes, chiefly in thickets; abundant about the east entrance. Plants 1 to 2 feet high, from large bulbs; leaves very long and narrow; flowers an inch broad, purplish blue. A handsome and showy plant, but usually out of flower before the tourist season opens. Camas is well known in the Northwest because the bulbs

were a food staple of the Indians. The word camas is used in many place names in Montana and in the States farther west.

Queencup (*Clintonia uniflora*). (Fig. 24.)—Common in all the heavily wooded portions of the park, especially under firs and spruces; rarely found except in heavy forest, but sometimes occurring under shrubs in subalpine places. One of the most beautiful plants of the region, and universally noticed by visitors. It is almost equally handsome in either flower or fruit. The leaves vary from 2 to 5; to many persons they suggest those of the lily of the valley. The pure white, starlike flowers do not last long; there is usually only one flower on each stalk, but occasionally there are two. The fruit, which matures in late summer, is deep prussian blue, and has a poisonous appearance; it is nearly flavorless and is not edible.

FIG. 21.—Glacier lily. Flowers yellow. Photograph by Fred H. Kiser, Portland, Oreg.

False Solomon's seal (*Vagnera amplexicaulis*). (Fig. 25.)—Common at nearly all altitudes below timber line; usually found in heavy woods or in thickets. Plants 1 to 2 feet high, usually finely hairy, rising from long, creeping, fleshy rootstocks; flowers very small, white, in loose panicles; fruit a sixth of an inch in diameter, 1 or 2 seeded, greenish pink dotted with dark red, or finally becoming wholly red. This species is widely distributed in the Western States, and similar ones occur in the East. The true Solomon's seal (of the genus *Polygonatum*) is not found in the park. Our plant is listed in some books under the name *Smilacina amplexicaulis*.

Star Solomon's seal (*Vagnera stellata*).—Common in all sorts of situations below timber line; usually found in woods or thickets. This has narrower leaves than the last species; the flowers are fewer, white, and star-like, and they are arranged in a raceme rather than a

panicle; the fruit is much larger, about a third of an inch in diameter, green, with 3 purplish black stripes, finally turning black. It is a rather attractive plant, but is never conspicuous.

FIG. 22.—Nodding onion. Flowers pink

FIG. 23.—Mariposa lily. Flowers white

FIG. 24.—Queencup. Flowers white

FIG. 25.—False Solomon's seal. Flowers white

Fairy bells (*Disporum*).—These are branched plants, 1 to 2 feet high, with broad leaves; the flowers are a third to half an inch long, bell-shaped, yellowish white or yellow, and drooping; they appear

in spring and are borne singly at the ends of the branches; the fruit is fleshy and contains several seeds. The plants are found in nearly all the wooded portions of the park, especially in moist places; they are very showy when in fruit in late summer. In the **smooth fairy bells** (*Disporum oreganum;* fig. 26) the fruit is shaped somewhat like a lemon; it is smooth and varies in color from lemon-yellow to orange. The **rough fairy bells** (*Disporum trachycarpum*) is the handsomer plant; its fruit is broader than long and somewhat 3-angled; it is rough and velvety, and at maturity is of the color of a strawberry.

Twisted-stalk (*Streptopus amplexifolius*). (Fig. 27.)—Common in nearly all the forested portions of the park, especially in moist

FIG. 26.—Smooth fairybells. Fruit yellow

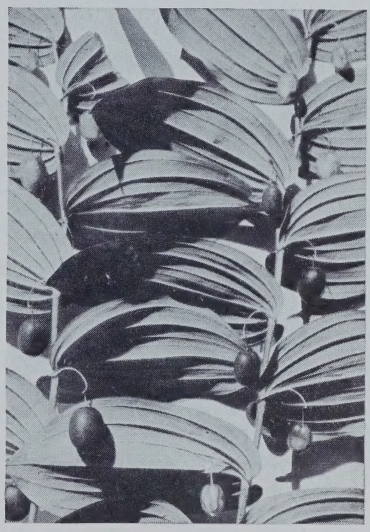

FIG. 27.—Twisted-stalk. Fruit red

woods; extending up to timber line. A smooth, branched plant, 1½ to 3 feet high, with broad clasping leaves which are pale on the under surface; flowers greenish white, a quarter of an inch long, narrowly bell-shaped, drooping from the axils of the leaves; fruit bright red, translucent, often half an inch long. This is a fine plant when loaded with its beautiful red fruit. The stalks which support the flowers are bent or twisted at the middle, hence the common name. The twisted-stalk is widely distributed in the United States. especially in mountain regions.

Wake-robin (*Trillium ovatum*). (Fig. 28.)—Confined, apparently, to the west slope, where it is frequent in moist or boggy places in deep woods. Stems a foot high or less, bearing at the summit one flower and a whorl of 3 broad leaves; flower an inch to an inch and a half

long, white, turning purple as it fades, with 3 petals; fruit a large, many-seeded berry. There are many kinds of trillium or wake-robin in the Eastern and Western States; their flowers are white, pink, purple, or greenish.

IRIS FAMILY. IRIDACEAE

The western **blue flag** or **iris** (*Iris missouriensis*) is frequent about low places on the prairie near the east entrance. It is common farther south in the Rockies. One species of **blue-eyed grass** (*Sisyrinchium*) is of rare occurrence in moist places at low altitudes. It is easily recognized by its grass-like leaves and small blue flowers.

FIG. 28.—Wake-robin. Flowers white. Photograph by Fred H. Kiser, Portland, Oreg.

ORCHID FAMILY. ORCHIDACEAE

Orchids are found in greatest abundance in the Tropics, but a large number of them grow in temperate regions. Most of those which are natives of warm countries are epiphytes—that is, they grow upon the trunks or branches of trees; but those of temperate climates grow upon the ground, like most other plants. In the United States epiphytic orchids are found only in Florida and a few others of the Gulf States.

Several of the Glacier Park orchids are attractive plants, although none are very showy. It is not improbable that some of the lady's-slippers (of the genus *Cypripedium*) grow in the park, but none have been definitely reported. One popular book dealing with the region speaks of the "acres of color made by orange, blue, and red lady's-slippers," about Piegan Pass, but the writers evidently drew upon a fertile imagination, for no lady's-slippers of any of these colors are found anywhere in the West, and a blue one would be a novelty, indeed!

White bog orchis (*Habenaria dilatata*). (Fig. 29.)—Common in bogs, damp meadows, and other moist situations at nearly all altitudes; in some places very abundant. Stems 1 to 2 feet high, hollow, smooth; roots a cluster of fleshy fibers; leaves several, scattered along the stout stem; flowers pure white, the lip petal broad at the base and with a slender spur. The flowers have a very strong fragrance, suggesting that of a carnation.

Green bog orchis (*Habenaria stricta*).—Common in the same situations as the white-flowered plant, the two often growing together. Very much like the preceding species, but the flowers green or yellowish green and odorless; lip petal long and very narrow, the spur at its base short and sacklike. The spikes are usually not quite so dense in this as in the white-flowered plant.

Wood orchis (*Habenaria unalaschensis*).—Found by the writer only near Many Glacier Hotel, but probably occurring elsewhere; it grows in rather dry woods. Plants a foot high or less; roots bulblike; leaves few, near the base of the stem, withering at or before flowering time; flowers very small, greenish, the lip petal with a slender spur at base. Easily recognized by the withering leaves; those of the bog orchis remain green until late in the season.

Two-leaf wood orchis (*Habenaria orbiculata*).—In moist or rather dry woods about Lake McDonald; scarce. Stem 1 to 2 feet high; leaves 2, at the base of the stem, spreading flat upon the ground, rounded, 6 to 8 inches long; flowers greenish white, in a loose spike; lip petal half an inch long, the slender spur at its base about an inch long.

One-leaf bog orchis (*Habenaria obtusata*).—In boggy woods in the horse pasture below Many Glacier Hotel; doubtless occurring in similar situations elsewhere. Plants 4 to 10 inches high, slender; leaf one, at the base of the stem, 2 to 4 inches long; flowers small, greenish, few, in a spike; lip petal with a slender spur at its base.

FIG. 29.—White bog orchis. Flowers white

Ladies'-tresses (*Ibidium romanzoffianum*[4]). (Fig. 30.)—Rare on the east slope, occurring in boggy meadows in the Many Glacier region and about the east entrance; abundant on the west slope in sphagnum bogs. Plants 5 to 12 inches high; leaves mostly borne near the base of the stem; flowers white, a third of an inch long. The flower spike is somewhat twisted; the flowers are arranged in three vertical rows, and the spikes are thus 3-angled. The flowers are showy and sweet scented.

Twayblade (species of the genus *Ophrys*[5]).—These little orchids are recognized easily by the two broad leaves, which are borne at the middle of the stem; the small greenish flowers are arranged in

[4] The name *Spiranthes romanzoffiana* is sometimes used for the plant.
[5] Some botanists use the name *Listera* for the genus.

slender racemes. There are three species in the park; they are about equally common, and grow in moist places in deep woods. The **heart-leaf twayblade** (*Ophrys cordata;* fig. 31) has leaves which are as broad as long or broader; the lip petal of the flower is very narrow and is divided halfway to the base into 2 narrow, sharp-pointed lobes. The other two species have leaves which are longer than broad, and the lip is wedge-shaped, with 2 short rounded lobes. In the **large-flowered twayblade** (*Ophrys convallarioides*) the lip is a third of an inch long; in the **small-flowered twayblade** (*Ophrys caurina*) the lip is scarcely a quarter of an inch long.

Rattlesnake plantain (*Peramium decipiens*[6]). (Fig. 32.)—Common in all the wooded portions of the park, usually in rather dry,

FIG. 30. — Ladies'-tresses. Flowers white

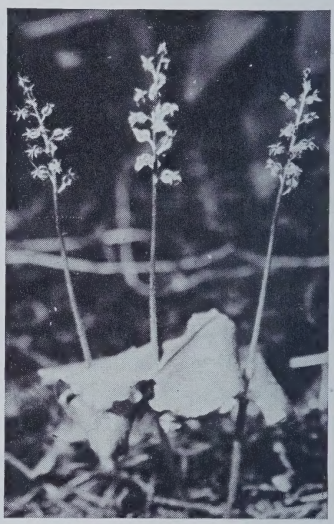

FIG. 31.—Heartleaf twayblade. Flowers greenish

well-shaded places. Plants 8 to 15 inches high, the stems covered with very short, sticky hairs; leaves mostly in a rosette at the base of the stem, 1½ to 2½ inches long, sharp pointed, blotched or veined with white; flowers a third of an inch long, greenish white. This orchid is widely scattered in North America. The "plantain" part of its common name is doubtless derived from the fact that the rosette of leaves suggests the leaves of common plantain (*Plantago major*); but there is no obvious explanation for the word "rattlesnake."

Calypso (*Cytherea bulbosa*).—Of rather rare occurrence in damp woods at low altitudes. Plants 2 to 6 inches high, smooth, from a

[6] Some botanists use the name *Goodyera decipiens* for the plant.

bulb-like root; leaf one, at the base of the stem, 1 to 1½ inches long; flowers purple, pink, and yellow, the sack-like lip nearly an inch long. This is the most handsome of the orchids found in the park, but it blooms so early (in May and June) that it is rarely seen by visitors. It grows all through the Rocky Mountain and Pacific coast regions, and is found also in some of the Northeastern States. Sometimes known as Venus' slipper.

Coralroot (species of the genus *Corallorhiza*).—These plants are easily recognized because they have none of the green coloring characteristic of most plants. They are saprophytes—that is, they live on decayed vegetable matter. They are of occasional occurrence in deep,

FIG. 32.—Rattlesnake plantain. Flowers greenish white

FIG. 33.—Coralroot. Flowers purple and whitish

moist woods, where they frequently form small colonies. The stems are smooth, 8 to 15 inches high, purplish, and leafless; the flowers are about half an inch long; the seed pods are conspicuous in late summer and are nearly an inch long. There are two species in the park. One (*Corallorhiza mertensiana;* fig. 33) has the lip petal wholly purple, while the other (*Corallorhiza multiflora*) has the lip white, with small purple spots. In both species the roots are knotted in such a way that they somewhat resemble coral; hence the common name.

WILLOW FAMILY. SALICACEAE

Willows, species of the genus *Salix*, are common and often abundant all through the park. Shrubby willows of many species grow

everywhere along streams; they are easily recognized by their narrow leaves and by their catkins; the small seed pods contain numerous seeds, each of which bears a tuft of silky white hairs. Low willows, 1 to 3 or 4 feet high, form a large proportion of the shrubby vegetation above timber line and on alpine rock slides. The most interesting willows are the little creeping species that are so abundant everywhere above timber line in grassy meadows and on rocky slopes. These creeping willows are shrubs, but they are only 1 to 3 inches high; their leaves and catkins, however, are nearly as large as those of the tall shrubby species.

Aspen (*Populus tremuloides*).—One of the commonest trees or shrubs of the park, occurring chiefly at low altitudes; the common broad-leaf tree along the automobile road on the east side, forming extensive thickets; it seems to be absent around the head of Lake McDonald, but is common at Belton. The aspen is so well known in the park that it needs no description. It is often called "quaking asp" or "quaking aspen." It is usually a small, slender tree, and has very smooth, close, whitish bark. The leaves are rounded, sharp pointed, and very finely toothed; they are on such slender stalks that the least breath of air keeps them in motion, consequently they are never still. The trees bear catkins like the willows, but nearly all the trees seem to be sterile. The quaking aspen is the commonest broad-leaf tree in the Rocky Mountains, and is widely scattered in other parts of North America. In the Rockies it is usually the first tree to spring up on burned areas. The leaves turn bright yellow in autumn.

FIG. 34.—Mountain alder

Black cottonwood (*Populus trichocarpa*).—Very common at low altitudes along and near streams on both slopes; the only cottonwood of the region. Many of the trees, especially on the west slope, attain a very large size. Although both the black cottonwood and aspen belong to the same genus (*Populus*), they are very unlike in general appearance, the former being a much larger tree; its leaves, too, are narrower, and have longer, sharper points, and they are very pale beneath. Young trees of the black cottonwood (as well as the upper branches of old trees) have smooth, pale bark like

the aspen, but old trees have deeply ridged bark, which always has a soft, velvety appearance. The trees bear catkins; the seed capsules contain numerous small seeds covered with white "cotton." The catkins have mostly fallen from the trees before the tourist season opens.

BIRCH FAMILY. BETULACEAE

Mountain alder (*Alnus tenuifolia*). (Fig. 34.)—Common at low altitudes, along streams and lake shores; not extending far up into the heavy timber on the east slope; abundant about Lake McDonald. Shrub, 6 to 10 feet high, or often a small tree with smooth, brown trunk; young twigs hairy; leaves 2 to 4 inches long, shallowly lobed, dull green on the under side; nutlets ("seeds") not winged. One of the most abundant shrubs along streams below and near the lower edge of the heavy timber. To many persons alders look very much like birches; but the fruit cones of a birch fall apart very easily, while those of an alder do not fall apart, even at maturity. The bracts which form the cones are 3-lobed in the birches, while in the alders they are not lobed.

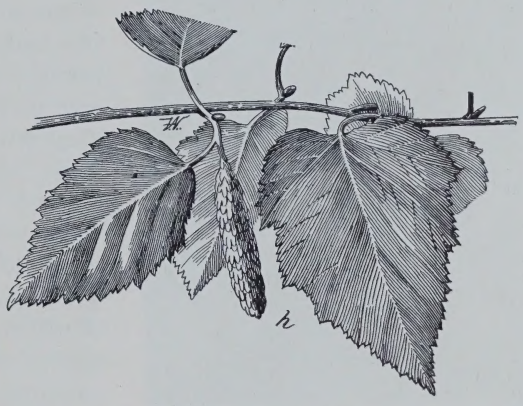

FIG. 35.—Paper birch

Green alder (*Alnus sinuata*).—Abundant at middle and high altitudes, extending up to timber line; often form-dense thickets on mountain slopes. Shrub, usually about 6 feet high; young twigs smooth or nearly so; leaves 2 to 4 inches long, bright green on both sides; nutlets with a broad wing on each side. A very characteristic shrub of higher altitudes, often forming almost impenetrable thickets. The two alders nearly always grow at different elevations, but sometimes, especially on the west slope, they are found together. The stems of the green alder are usually bent down toward the ground, probably by the snow banks which cover them in winter. Around timber line the plants are often only 3 feet high.

Paper birch (*Betula papyrifera*). (Fig. 35.)—Common on the west slope, along lakes and streams and even on dry slopes; reported to grow in some places on the east slope, but certainly very rare in that region, if it occurs there at all. Small or large tree, sometimes 60 feet high; bark white or gray (at least on older tree)

separating into thin, papery sheets; leaves 1 to 4 inches long, slightly hairy beneath. Paper birch is one of the characteristic trees of the west slope, but it does not ascend to very high altitudes—about as high as the larch, apparently. Very frequently the trunks and branches are densely covered with lichens. This is the tree from whose bark the Indians formerly made canoes.

Brown birch (*Betula occidentalis*).—Along streams at low altitudes. This seems to be rare, but it occurs in a few places. Small tree, with brown bark which separates into thin sheets; twigs covered with large sticky glands; leaves large, sharp pointed, sharply toothed, more or less hairy beneath.

FIG. 36.—Scrub birch

Water birch (*Betula fontinalis*).—About St. Mary, but scarce; probably occurring elsewhere also. Shrub or small tree, the bark brown, close, not separating into sheets, the twigs covered with glands and consequently very sticky; leaves 1 to 2 inches long, sharp pointed, sharply toothed.

Scrub birch (*Betula glandulosa*). (Fig. 36.)—Common in many places on the east slope at all altitudes; at low elevations usually growing along streams or in swamps; high up, as at Gunsight Pass, growing on open, rocky slopes. Densely branched shrub, 3 to 6 feet high, the twigs very glandular and sticky; leaves an inch long or less, rounded at both ends, the margin with low, rounded teeth. The scrub birch, which is very different in size and leaf shape from our other birches, has a wide distribution in Canada and the northern United States.

NETTLE FAMILY. URTICACEAE

Nettle (*Utrica lyallii*).—Abundant throughout the park, especially in moist or wet places. Easily recognized by the slender, stinging hairs, which, in contact with the skin, produce a painful sensation that sometimes endures for several days. There is no truth in the assertion, so often heard, that if nettle plants are grasped boldly they will not sting one.

MISTLETOE FAMILY. LORANTHACEAE

There are none of the true American mistletoes (of the genus *Phoradendron*) in Montana, but the **lodgepole mistletoe** (*Razoumofskya americana*) is found occasionally on branches of lodgepole pine. It is a small, greenish yellow plant, 2 to 4 inches high, with jointed stems, scalelike leaves, and very small, bluish, juicy fruit. The plant is difficult to discover because of its small size and because it is half hidden among the pine needles, but its presence is often indicated by the formation of "witches' brooms," which consist of a mass of short, more or less deformed branches. Other mistletoes probably occur in the park upon the Douglas fir and larch, but so far they have not been collected.

BUCKWHEAT FAMILY. POLYGONACEAE

Most of our plants of this family are inconspicuous weeds, some of which have been introduced into North America from Europe. All are herbs with alternate leaves (leaves mostly borne at the base of the stem in species of *Eriogonum*); the flowers are small and most commonly green; they have sepals but no petals; the achenes or "seeds" are usually 3-angled.

FIG. 37.—Small bistort. Flowers white

Several kinds of **dock** (of the genus *Rumex*) grow in the park; they are coarse weedy plants with dense panicles of green flowers. **Sheep sorrel** (*Rumex acetosella*) is a common weed in many places; it is 6 to 20 inches high; the leaves have 2 sharp lobes at the base, and they have an acid flavor; the very small flowers are tinged with red.

Mountain sorrel (*Oxyria digyna*). (Pl. II.)—Abundant at high altitudes, chiefly in meadows and on rock slides above timber line; sometimes growing along streams at lower altitudes. Plants usually forming dense clumps, 4 to 18 inches high, smooth; leaves mostly clustered at the base of the stem, kidney-shaped or rounded, about an inch broad, long-stalked; flowers tinged with red. A very characteristic plant of alpine meadows, apparently a favorite food of goats, sheep, and ptarmigan. The plants are showy because of the red coloring of the flowers. The leaves have a pleasant acid flavor, and may be used to flavor sandwiches and salads.

Small bistort (*Polygonum viviparum*). (Fig. 37.)—Frequent in alpine meadows or on rock slides and sometimes in woods. Plants 4 to 6 inches high, smooth; flowers greenish white, often replaced by little green bulblets. **Common bistort** is a similar plant, but taller, 8 to 18 inches high, with larger (1 to 2 inches long) spikes of white flowers. It is a rather showy plant of alpine meadows; the flower spikes, which somewhat suggest clover heads, bend gracefully before the wind.

Silver plant (*Eriogonum depressum*). (Fig. 38.)—Common at nearly all altitudes, on open, rocky slopes; plants about 4 inches high, forming small, dense mats; leaves borne at the base of the plant, covered with fine, matted, white hairs; flowers yellowish white, often

FIG. 38.—Silver plant. Flowers yellowish white

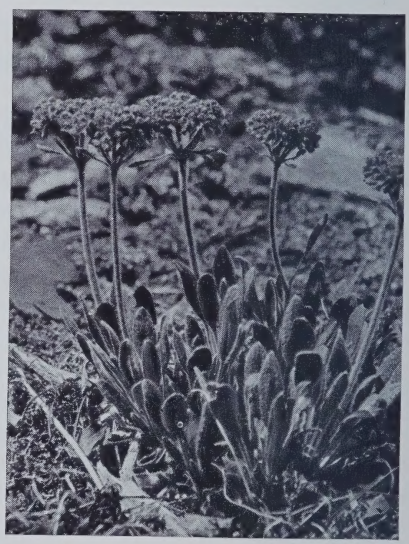

FIG. 39.—Sulphur plant. Flowers yellow

tinged with red. This and several related species with white leaves have received the name of silver plant because there was a belief among the early prospectors that the plant indicated the presence of silver deposits. It is needless to state that there is no real basis for this belief.

Alpine silver plant (*Eriogonum androsaceum*).—Of rather rare occurrence, and rarely found except at the highest elevations—about Grinnell Glacier, Sexton Glacier, Piegan Pass, etc. It is similar to the common silver plant and forms very dense mats. The stems are only 1 to 4 inches high; the leaves are rounded, white-hairy beneath but green on the upper surface; the flowers are very pale yellow.

Sulphur plant (*Eriogonum piperi*). (Fig. 39.)—Common at nearly all altitudes, on open, usually rocky slopes; also on plains and rock

slides. Plants 4 to 12 inches high; leaves green on the upper side, covered beneath with white, silky hairs; flowers bright yellow, somewhat hairy, when old often tinged with red. A very showy plant, remaining in flower a long time.

Umbrella plant (*Eriogonum subalpinum*). (Fig. 40.)—Abundant at low and middle altitudes, in open, usually rocky places. Very similar in general appearance to the sulphur plant, but more slender, forming dense mats; leaves green on the upper surface, covered beneath with white, matted hairs; flowers white, smooth, when old often tinged with pink.

Alpine spring beauty (*Claytonia megarrhiza*). (Fig. 41.)—Frequent on alpine rock slides. Leaves smooth, in a dense cluster, an

FIG. 40.—Umbrella plant. Flowers white. Photograph from Mrs. William Warren

FIG. 41.—Alpine spring beauty. Flowers pink or white

inch long or smaller, fleshy; flower stems scarcely longer than the leaves; flowers pink or white, the petals a third of an inch long. The plants grow among loose rocks. Their fleshy roots are elastic like rubber, consequently when rocks roll over them they are not so easily torn loose as they would be if the roots were more rigid or brittle.

Western spring beauty (*Claytonia lanceolata*).—In moist, grassy meadows above timber line. Plants 2 to 4 inches high, smooth, the stems rising from a bulb-like root, with one leaf at the base; stem leaves 2, at the middle of the stem, 2 inches long or shorter, usually sharp pointed, the margins entire; flowers few, the 5 small, pink petals shallowly notched at the end. The species is very much like the eastern spring beauty (*Claytonia virginica*), but has much

broader leaves. It is not a conspicuous plant and remains in bloom only a short time. The plants with open flowers are usually found close to snow banks. The roots were boiled and eaten by the Blackfoot Indians.

Pink spring beauty (*Claytonia parviflora*). (Fig. 42.)—Common chiefly in woods, along streams, and in other moist or wet places. Plants with prostrate or nearly prostrate stems bearing numerous small, fleshy, scattered leaves; flowers pink, a third of an inch long. The plants often form mats of interlaced branches, and the small but abundant flowers are rather showy. Numerous little green bulblets are borne in the axils of the leaves; these fall upon the ground and produce new plants.

FIG. 42.—Pink spring beauty. Flowers pink

FIG. 43.—Bladder campion. Calyx striped with purple. Photograph from Mrs. William Warren

PINK FAMILY. SILENACEAE [7]

The members of the group are herbaceous plants with opposite entire leaves; the petals are usually 5; there are 5 (rarely 4) sepals, which are either distinct or united at the base; the stamens are twice as many as the sepals or fewer; the fruit is a dry capsule containing few or numerous seeds.

Carpet pink (*Silene acaulis*). (Pl. III, fig. 1.)—Common in alpine meadows and on high rock slides. Plants forming dense, small or large mats; leaves linear, very short; flower stems 1 to 2 inches high; flowers pink or purple-pink, a third of an inch broad. When

[7] The name Caryophyllaceae is often used for the family.

in full bloom the plants form sheets of beautiful color that are one of the most showy features of alpine meadows. Unfortunately, the plants remain in flower only a short time, but scattered mats often may be found late in the season on ground from which snow has recently melted.

White catchfly (*Silene multicaulis*).—Common at middle and high altitudes, chiefly in meadows or on open hillsides. Plants 6 to 15 inches high, the stems covered with very short, sticky hairs; flowers white, or sometimes tinged with pink; petals 5, an inch long or shorter, lobed; calyx often purplish. A showy plant, which blooms for a long time. The flowers close before noon except on cloudy days.

Bladder campion (*Lychnis apetala*). (Fig. 43.)—Occasional on rock slides above timber line. Plants loosely tufted, 2 to 6 inches high, covered with fine sticky hairs; flower half an inch long, the calyx inflated and balloon-like, striped with deep purple; petals small and inconspicuous. The nodding flowers are strikingly suggestive of Chinese lanterns.

FIG. 44.—Mouse-ear chickweed. Flowers white. Photograph by Albert Haanstad, Denver, Colo.

Chickweed (species of the genus *Stellaria*).—Several kinds of chickweed are common in the park, usually in woods or moist places. They are small, slender plants with narrow or broad leaves; the flowers are small, white, and starlike; the petals are deeply 2-lobed; the seed pod is usually very short. One species (*Stellaria americana*) abundant on alpine rock slides is a prostrate, matted plant, densely covered with very sticky hairs; the broad leaves are blunt pointed and about an inch long; the white flowers are borne singly in the axils of the leaves.

Mouse-ear chickweed (species of the genus *Cerastium*). (Fig. 44.)—Several species are common in alpine meadows and at lower altitudes. They are small, sticky, loosely matted plants with broad or narrow leaves; the small (one-fourth to one-third of an inch long) white flowers have deeply 2-lobed petals; the seed pod is cylindrical and much longer than the calyx.

Sandwort (species of the genus *Arenaria*).—A rather large number of species of sandwort occur in the park, but most of them are incon-

spicuous plants. They have small white flowers whose petals are only shallowly or not at all notched at the tip. **Grass sandwort** (*Arenaria formosa;* fig. 45) is abundant at nearly all altitudes in meadows or open, rocky places. The plants are 3 to 6 inches high and often form dense clumps; the leaves are slender, stiff, and grass-like; the flowers are a quarter of an inch long.

WATER LILY FAMILY. NYMPHAEACEAE

Yellow pond lily (*Nymphaea polysepala*).—Yellow pond lilies are widely distributed in the United States, but the species found in the park is one which is confined to the West. It occurs only on the west side of the park, at low altitudes, where it is abundant in the smaller lakes. The large, heart-shaped leaves float upon the surface of the water, and their stalks, which rise from the bottom of the lake, are often very long. The yellow and green flowers, usually tinged with red, are held above the surface, but as the large fruit matures it sinks to the bottom. The fruit contains a great number of small, shining seeds, which are collected for food by certain Indians of the Northwest, who use the name "wokas" for the plant.

FIG. 45.—Grass sandwort. Flowers white. Photograph by E. R. Warren

CROWFOOT FAMILY. RANUNCULACEAE

Herbs (clematis a climbing shrub) with alternate leaves; flowers usually showy, commonly with 5 petals; in some groups there are no petals, but the sepals resemble petals.

Anemone[8] (species of the genus *Anemone*).—In this genus the flowers have no petals, but the 5 or 6 sepals are colored and resemble petals. The fruit is a head of small, silky-hairy, seedlike achenes.

Northern anemone (*Anemone parviflora*). (Fig. 46.)—Frequent in meadows and on rock slides above timber line; rarely found at lower elevations. Plants 2 to 6 inches high; leaves sparingly hairy, less than an inch long, divided to the base into 3 broadly wedge-shaped lobes which have shallow, rounded lobes and teeth; flowers white, often tinged with blue or pink, half an inch to an inch broad.

Alpine anemone (*Anemone tetonensis*).—Common on alpine rock slides and meadows. Stems 4 to 12 inches high, silky-hairy; leaves

[8] Pronounced in English ă-nĕm'-ō-nē; but in Latin ă-nē-mō'-nē.

divided into numerous narrow, blunt-pointed lobes; flowers pale blue or bluish white, three-quarters of an inch broad.

Common western anemone (*Anemone globosa*). (Fig. 47.)—Frequent in woods and in open places at nearly all altitudes. Plants 8 to 15 inches high, densely silky-hairy; leaves divided into numerous very narrow, sharp-pointed lobes; sepals half an inch long or shorter, bluish outside, yellowish white inside. The illustration shows the plant in fruit.

Western pasque flower (*Pulsatilla ludoviciana*).—Common at low altitudes, on prairie and open hillsides. Plants 4 to 15 inches high, very hairy; leaves divided into numerous narrow lobes; sepals petal-like, purple or violet, 1 to 1½ inches long; fruit a head of

FIG. 46.—Northern anemone. Flowers white

FIG. 47.—Common western anemone. In fruit

small achenes with long, hairy, spreading tails. A very showy plant, but it blooms so early in spring that it is not likely to be seen in flower by visitors to the park.

Mountain pasque flower (*Pulsatilla occidentalis*). (Fig. 48.)—Not very abundant in Glacier Park, but found at Grinnell Lake, Morning Eagle Falls, Sexton Glacier, and in similar localities. Stems usually low when in flower but in fruit about 2 feet high, thinly hairy; sepals an inch long, white or tinged with purple. This plant also blooms early in the season but the plants are occasionally found in flower in summer near snow banks. The soft, silky fruiting heads are very handsome and attractive. This species does not extend south of Montana in the Rocky Mountains; it is abundant on Mount Rainier and elsewhere in the Pacific coast region.

Meadow rue (*Thalictrum megacarpum*). (Fig. 49.)—Abundant nearly everywhere below timber line, and also in alpine meadows. Plants 1 to 3 feet high, smooth or nearly so; flowers small, greenish, with 4 or 5 sepals and no petals; stamens large and conspicuous; fruit a head of small, ribbed, seedlike achenes. The handsome foliage suggests to many people the maidenhair fern; indeed in the Rocky Mountain region where the maidenhair is rare or absent meadow rue is often mistaken for it. Species of meadow rue are found in most parts of the United States.

Purple clematis (*Clematis columbiana*). (Fig. 50.)—Common at low and middle altitudes, in woods or thickets. A slender, woody

FIG. 48.—Mountain pasque flower. In fruit. Photograph by Asahel Curtis

FIG. 49.—Meadow rue. Flowers green. Photograph from Mrs. William Warren

vine, climbing over bushes; leaves composed of 3 leaflets, these thin, 1 to 4 inches long; flowers solitary in the axils of the leaves, on long, slender stalks; petals none or very small, the 4 sepals purple and petallike, 1 to 2 inches long. The flowers have mostly disappeared before the opening of the tourist season, but the large, feathery fruiting heads (shown in the illustration) render the plants conspicuous. The cultivated species of *Clematis* are closely related.

White clematis (*Clematis ligusticifolia*).—Rather scarce; at low altitudes, on dry, open, rocky slopes, etc. A slender vine; leaves with 5 or 7 toothed leaflets; flowers small, white, in large panicles, the sepals nearly half an inch long. This closely resembles one of the clematis species (*Clematis paniculata*) which is common in cultivation.

CARPET PINK

HAREBELL

Alpine buttercup (*Ranunculus alpeophilus*). (Fig. 51.)—Abundant above timber line, in meadows and on rock slides. Plants 3 to 10 inches high, smooth; leaves rather fleshy, those at the base of the stem toothed, the others deeply lobed; flowers bright yellow, about half an inch broad, with 5 petals and 5 sepals. A very showy plant; the only buttercup that is found here commonly at high altitudes.

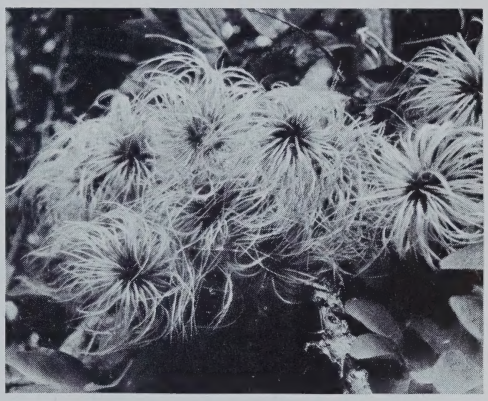

FIG. 50.—Purple clematis. In fruit

Creeping buttercup (*Ranunculus reptans*).—Common in mud about streams and lakes and in other wet places at low altitudes; also in a moist meadow at Swiftcurrent Pass. The bright yellow flowers are only a quarter of an inch broad; the slender stems creep over the ground and take root at the joints; the leaves are small and narrow and have entire margins. Several other kinds

FIG. 51.—Alpine buttercup. Flowers yellow

FIG. 52.—Baneberry. Fruit red or white

of buttercups, all with bright yellow flowers, grow in the park, but they are usually not sufficiently abundant to be conspicuous.

Baneberry (*Actaea rubra*). (Fig. 52.)—Common in all the wooded regions; sometimes found in meadows above timber line. Plants

coarse, 2 to 3 feet high; leaves few, large, composed of numerous large, toothed, nearly smooth leaflets; flowers small, greenish white, in long racemes; fruit juicy, a quarter to half an inch long. The flowers are inconspicuous, but plants with ripe fruit are very showy and handsome. The fruit is either bright red or clear white, and both colors are characteristic of this one species. The white fruit looks exactly as if it were made of china; hence the name chinaberry that is sometimes applied to the plant. The fruit is not edible. The baneberry has a wide distribution in North America and is common in the northern United States.

Yellow columbine (*Aquilegia flavescens*). (Fig. 53.)—Abundant at higher altitudes, in woods or meadows or on rock slides. Plants 8

FIG. 53.—Yellow columbine. Flowers pale yellow

FIG. 54.—Blue larkspur. Flowers blue

to 24 inches high; leaves composed of numerous broad, smooth leaflets; flowers pale yellow. One of the handsomest flowers of the park; in some localities very abundant and affording a fine display of color. The flowers vary somewhat in color and are often tinged with pink. Red columbine, which is mentioned in one of the books describing the park, is not known to grow in this region.

Blue columbine (*Aquilegia jonesii*).—Common on alpine rock slides. Plants tufted, 3 to 6 inches high; leaves mostly crowded at the base of the stem, composed of small, finely hairy leaflets; flower one on each stem, purple-blue, an inch long. One of the rarest of American columbines, its range extending only from Wyoming to Alberta. The flowers are very beautiful, but they last only a short time. The

Rocky Mountain columbine with large, pale blue flowers, which is so common farther south, is not found in Glacier Park.

Blue larkspur (*Delphinium nuttallianum*). (Fig. 54.)—Frequent in meadows above or just below timber line; abundant in some localities. Stems slender, about a foot high, smooth or nearly so; leaves divided into numerous very narrow lobes; flowers few, deep purplish blue, each one with a long spur.

Globeflower (*Trollius albiflorus*). (Fig. 55.)—Common in meadows above timber line. Plants smooth, 4 to 20 inches high; stems 1-flowered; leaves deeply lobed; flowers dirty white, nearly an inch broad; sepals petal-like, the proper petals small and inconspicuous; fruit of several small pods. One of the first plants to flower after the snow leaves the ground. The stems often shoot up through the snow, like those of the glacier lily, with which the globeflower often grows.

FIG. 55.—Globeflower. Flowers dirty white. Photographed by Fred H. Kiser, Portland, Oreg.

BARBERRY FAMILY. BERBERIDACEAE

Oregon grape (*Berberis repens*). (Fig. 56.)—Of common occurrence at lower levels, in thin, usually rocky woods; often growing in lodgepole pine timber and in the heavier forest of fir and spruce. The plants are shrubby and rarely more than a foot high; the evergreen leaves are composed of 5 to 11 large, green, leathery leaflets with spiny margins, and they are often beautifully colored with red and bronze in late summer. The racemes of small yellow flowers appear in spring. The showy and handsome fruit matures in late summer; it is dark blue, with a whitish bloom, very juicy, with a sour but rather pleasant flavor; it is frequently used for making jelly. The plants are much larger and more showy on the west slope than on the east. The western Oregon grape, a very similar but taller plant, is the State flower of Oregon.

POPPY FAMILY. PAPAVERACEAE

Alpine poppy (*Papaver pygmaeum*). (Fig. 57.)—Frequent on the highest, most exposed rock slides. Plants usually densely tufted; leaves deeply lobed, with scattered, bristly hairs; flower stems 1 to 2

inches high, each bearing a single flower; petals 4, a third of an inch long, orange, with a pale yellow spot at the base. This rare plant is known in the United States only from the mountains of Montana, but it grows also in Alberta and British Columbia. It has such small flowers that at first glance it appears to have little resemblance to our showy cultivated poppies, all of which are natives of the Old World. It grows only in places where the vegetation is very scant, and even here its gray-green color renders it inconspicuous. It is more abundant at Sexton Glacier and Piegan Pass than elsewhere.

FIG. 56.—Oregon grape. Fruit blue

MUSTARD FAMILY. BRASSICACEAE [9]

Herbaceous plants, many of them weeds, with watery, pungent-flavored sap; leaves alternate; flowers composed of 4 petals and 4 sepals; stamens usually 6. The pungent, "hot" flavor of the juice is a striking characteristic of the family. Many plants of this group occur in the park, but few of them are showy, and most of them attract little attention. Besides those listed below, the following are common: **Peppergrass** (*Lepidium densiflorum*); a well-known weed, common in many places, easily recognized by the very small, flat, round pods. **Shepherd's purse** (*Bursa bursa-pastoris*); a common week at low altitudes; leaves deeply lobed, mostly in a rosette at the base of the stem; flowers small, white; pods small, flat, triangular. Several species of **yellow cress** (*Radicula*); smooth plants of wet soil, with deeply lobed leaves, small yellow flowers, and short, cylindrical or club-shaped pods. Several species of **tansy mustard**

FIG. 57.—Alpine poppy. Flowers orange

[9] The name Cruciferae also is used for the family.

(*Sophia*); tall, finely hairy, annual plants, with much divided, finely hairy leaves, small, dull yellow flowers, and slender, cylindrical pods; frequent at low and middle altitudes. **Wild wallflower** (*Cheirinia cheiranthoides*); a tall, grayish plant with narrow leaves, small yellow flowers, and long, slender, erect pods.

Wild candytuft (*Smelowskia americana*). (Fig. 58.)—Common in alpine meadows and on rock slides. Plants 4 to 8 inches high, finely and densely gray-hairy; leaves divided into narrow lobes; flowers pure white, a quarter of an inch broad; pods flattened, finely hairy, half an inch long or shorter. A conspicuous plant, but one which remains in bloom only a short time. The flowers resemble those of sweet alyssum.

FIG. 58.—Wild candytuft. Flowers white

Fan weed (*Thlaspi arvense*).—A common weed at low altitudes; introduced from Europe. Plants annual, smooth, 4 to 18 inches high; leaves narrow, finely toothed; flowers white, a third of an inch broad; pods flat, rounded, half an inch long, winged around the edge, notched at the top. Frequent on the east slope about the entrance and in the Many Glacier region; often forming large patches. After flowering the plants turn yellow, and are then very conspicuous. In some parts of the West this is known as "Jim Hill weed," because the ranchmen noticed that it appeared soon after the building of the Great Northern Railroad.

Whitlow grass (species of the genus *Draba*).—Several species of whitlow grass occur in the park. They are found at all altitudes, but are most likely to be noticed in alpine meadows or on rock slides, where some of them are common. They are mostly small plants, 1 to 4 inches high, often tufted, with small, entire or toothed leaves; the flowers are small, yellow or white; the pods are broad and flat and often twisted.

Rock cress (species of the genus *Arabis*).—Several kinds of rock cress are found in the park and they grow at nearly all altitudes, but only those found above timber line are likely to be noticed. They are low or tall, smooth or hairy plants, with narrow, entire or toothed

leaves; the flowers are white or purple; the long, narrow pods stand erect upon their stalks or often droop.

Purple rock cress (*Arabis lyallii*). (Fig. 59.)—Common in alpine meadows and on rock slides. Plants 4 to 8 inches high, smooth, the narrow leaves with entire margins; flowers purple, a third of an inch long; pods erect, nearly 2 inches long. A rather showy little plant which may be found in flower nearly all summer.

Gray rock cress (*Arabis lemmonii*).—Common in alpine meadows and on rock slides. Similar to purple rock cress, but the leaves covered with very fine, gray hairs, and the pods drooping; flowers pink or purple.

FIG. 59.—Purple rock cress. Flowers purple

FIG. 60.—Yellow stonecrop. Flowers yellow

SUNDEW FAMILY. DROSERACEAE

Sundew (*Drosera rotundifolia*).—The common sundew grows abundantly in sphagnum bogs about Johns and Fish Lakes on the west side of the park, and doubtless in other similar situations. It is easily recognized by the rosette of small, rounded, slender-stalked leaves, half hidden by the sphagnum, which are covered with reddish hairs, each bearing a sticky gland at the tip; the flowers are small and white. Another species, the **narrow-leaf sundew** (*Drosera longifolia*), was found by the writer in the sphagnum bog about Fish Lake; it has long, narrow leaves shaped somewhat like a canoe paddle. The sundews are an interesting group of carnivorous plants, closely related to the Venus's flytrap (*Dionaea mucipula*), a plant of the coastal region of North and South Carolina, which is

mentioned in all botanical textbooks. The leaves of the sundew are covered on the upper surface with slender hairs, each of which exudes a clear, reddish, viscid fluid which entraps small insects. The hairs then bend inward toward the center of the leaf and the insects are finally digested and absorbed as food by the plant.

STONECROP FAMILY. CRASSULACEAE

Yellow stonecrop (*Sedum stenopetalum*). (Fig. 60.)—Common at middle and high elevations, in alpine meadows, and on open, stony hillsides. Plants 3 to 5 inches high, smooth; leaves mostly clustered at the base of the plant, very fleshy, cylindrical, half an inch long or shorter; flowers bright yellow, with 5 petals. A handsome plant when in full flower, and the flowers last a long time. There is a second species of yellow stonecrop (*Sedum douglasii*) in the park which grows chiefly at low altitudes. It is very similar but the leaves are usually longer and somewhat flattened. In late summer there are formed on the flowering branches numerous little bulblets or small plants which fall to the ground and develop into large plants.

FIG. 61.—Red stonecrop. Flowers deep red

Red stonecrop (*Sedum integrifolium*). (Fig. 61.)—Common in alpine meadows and on rock slides. Plants 2 to 4 inches high, smooth, very fleshy; leaves flat, half an inch long or less; flowers small, dark purple. The plant is conspicuous because all its parts are tinged with red or purple in late summer.

PARNASSIA FAMILY. PARNASSIACEAE

Fringed parnassia (*Parnassia fimbriata*). (Fig. 62.)—Abundant at nearly all altitudes and along streams or in other wet places. Plants 6 to 12 inches high, smooth; leaves 1 to 1½ inches wide, kidney-shaped, the margins entire; flowers white, the petals a third of an inch long, fringed along the edges; fruit a capsule containing numerous seeds.

Three other species of parnassia grow in the park; they differ from the fringed parnassia in having petals which are not fringed.

Alpine parnassia (*Parnassia kotzebuei*) has no leaf on the stem; the petals are not longer than the sepals; it grows along the brooks at Grinnell Glacier and in other similar places. The two following species have a small leaf on the stem and the petals are longer than the sepals. **Meadow parnassia** (*Parnassia palustris*) has petals nearly twice as long as the sepals; there are 9 to 15 sterile stamens in each of the clusters between the large fertile stamens; it has been found at St. Mary. **Montana parnassia** (*Parnassia montanensis*) has petals only slightly longer than the sepals; there are only 7 to 9 sterile stamens in each cluster; it grows in wet places near the foot of Lake McDermott and about the east entrance.

FIG. 62.—Fringed parnassia. Flowers white

FIG. 63.—Miterwort. Flowers green

SAXIFRAGE FAMILY. SAXIFRAGACEAE

Small herbs, smooth or hairy; leaves scattered along the stem, or often all borne at the base of the plant; flowers small, composed of 5 petals and 5 sepals (petals sometimes absent); stamens 5 or 10.

Miterwort (species of the genus *Mitella*).—Several species of miterwort grow at almost all altitudes in the park, usually in woods or in high, moist meadows. They are perennial plants with large tufts of rounded, slender-stalked, hairy leaves; the flower stems are slender and leafless, and the flowers are very small and usually yellowish green; the small petals are divided into short, threadlike lobes. The species are separated by details of the flowers, which although small are easily determined. The commonest species (*Mitella pentandra*,

fig. 63) has 5 stamens, each of which is opposite a petal. Another species (*Mitella breweri*) has 5 stamens, but these are borne between the petals. One species (*Mitella nuda*) is distinguished by having 10 stamens. The last species (*Mitella violacea*), which seems to be rare, has 5 stamens, but the petals are entire or only slightly toothed. In all the species the small seed pod opens when ripe and is saucer-shaped, with the tiny black seeds exposed like eggs in a nest.

Alumroot (*Heuchera glabella*). (Fig. 64.)—Common at nearly all altitudes; usually on cliffs or open rocky slopes; extending also to the prairie. Plants 8 to 18 inches tall, in dense clumps; leaves tufted at the base of the stem, rounded, 1 to 2 inches long, smooth; flower

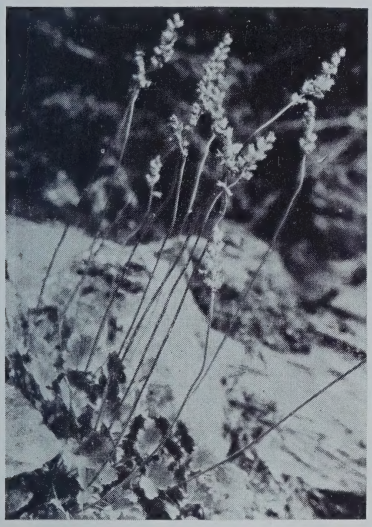

FIG. 64.—Alumroot. Flowers yellowish white

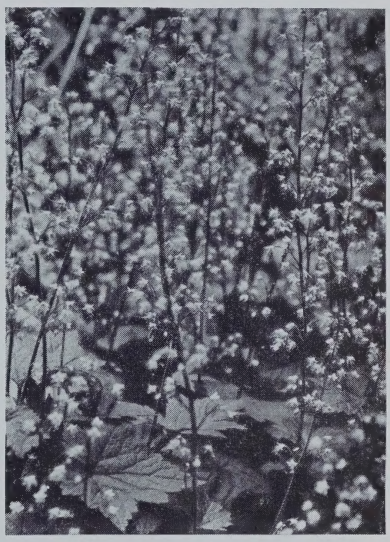

FIG. 65.—Lace flower. Flowers white

stems leafless, the flowers yellowish white, about a quarter of an inch long. The flowers are rather handsome. In late summer the leaves are beautifully colored with red and bronze, and remind one of the galax leaves which are used by florists. Various species of alumroot are widely distributed in the United States.

Lace flower (*Tiarella unifoliata*). (Fig. 65.)—Abundant nearly everywhere in deep woods. Plants slender, 6 to 15 inches high, slightly hairy; leaves mostly clustered at the base of the plant, slender-stalked, heart-shaped; flower stem bearing only one leaf; flowers very abundant, white. Great banks of this delicate, graceful plant abound along nearly all trails through heavy woods. The flower sprays are held well above the leaves and they give the effect of a haze of white above the bank of handsome green leaves. The plants

remain in flower nearly all summer but they are most showy early in the season.

Cliff saxifrage (*Hemieva ranunculifolia*).—Frequent on wet cliffs above or below timber line; a fine display of the plant on mossy cliffs at Baring Falls. Plants similar in appearance to the saxifrages, but easily distinguished by the fact that each of the lower leaves is divided into 3 broadly wedge-shaped leaflets; plants 6 to 12 inches high, slender, from a bulblike root, nearly smooth; flowers numerous, in a panicle; petals small, white or yellowish white, remaining on the flower a long time.

Pink cliff saxifrage (*Hemieva violacea*).—On wet, mossy cliffs at Baring Falls, and doubtless elsewhere. Plants slender, 4 to 8 inches

FIG. 66. — Redstem saxifrage. Flowers white

FIG. 67. — Bulbous saxifrage. Flowers white. Photograph from Mrs. William Warren

high, finely viscid-hairy; roots bulblike; leaves at the base of the stem kidney-shaped, about an inch broad, with low rounded teeth; flowers few, panicled, the petals pink, a quarter of an inch long.

Saxifrage (species of the genus *Saxifraga*).—Several saxifrages grow in the park at all altitudes. They vary greatly in appearance but most of them have alternate leaves (the leaves all borne at the base of the stem in some species) and small flowers; the fruit consists of 2 or more small pods.

Red-stem saxifrage (*Saxifraga lyallii*). (Fig. 66.)—Abundant in alpine meadows, forming dense carpets along brooks and in moist places. Plants 3 to 8 inches high, smooth; stems purplish red, slender; leaves forming a rosette at the base of the plant, one-half to 2½

inches long, fleshy; petals white, a sixth of an inch long, with 2 yellow spots below the middle; sepals and pods deep purplish red. A very conspicuous plant because of its abundance and handsome because of the bright purple-red coloring.

Bulbous saxifrage (*Saxifraga cernua*). (Fig. 67.)—Frequent on alpine rock slides. An inconspicuous little plant, 2 to 5 inches high, covered with very fine, sticky hairs; leaves scattered along the stem, half an inch broad, 5 or 7 lobed; flowers few, the upper one with white petals a quarter of an inch long, the lower flowers replaced by clusters of tiny bulblets.

Pygmy saxifrage (*Saxifraga adscendens*).—Frequent on alpine rock slides but very inconspicuous. Plants usually solitary, 1 to 3 inches high, finely viscid-hairy; leaves borne at the base of the plant and scattered along the stem, wedge-shaped, a third of an inch long or smaller, 3-toothed at the apex; petals white, an eighth of an inch long.

FIG. 68.—Spotted saxifrage. Flowers white

Spotted saxifrage (*Saxifraga bronchialis*). (Fig. 68.)—Abundant almost everywhere on open, rocky slopes. Plants densely matted, reddish; leaves densely clustered at the base of the plants, very narrow, half an inch long, bristle-pointed, the margins entire; flower stems 3 to 6 inches high, bearing several small flowers; petals a quarter of an inch long, white, often dotted with yellow. The leaves have very prickly tips. The plants bloom for a long time.

Purple saxifrage (*Saxifraga oppositifolia*).—Rare; on the moraine of Sexton Glacier and probably elsewhere. Plants prostrate and densely matted; leaves opposite, crowded on the stems, broad, a sixth of an inch long, finely hairy on the edges; flower one on each stem, purple, the petals a third of an inch long. A very showy plant when in full flower.

Sticky saxifrage (*Saxifraga brunoniana*).—Common on cliffs and in moist, rocky places. Plants 5 to 15 inches high, covered with short sticky hairs; leaves narrowly wedge-shaped, 1 to 3 inches long, coarsely toothed; flowers very numerous in a loose panicle, starlike; petals white, a fifth of an inch long.

Meadow saxifrage (*Saxifraga rhomboidea*). (Fig. 69.)—Common in alpine meadows and on rock slides. Plants 3 to 10 inches high,

finely viscid-hairy; leaves in a rosette at the base of the stem, broad, 1 to 2 inches long, blunt-pointed, finely toothed; flowers very small, white, in dense, headlike clusters.

FIG. 69. — Meadow saxifrage. Flowers white. Photograph by E. R. Warren

FIG. 70.—Slender saxifrage. Flowers white

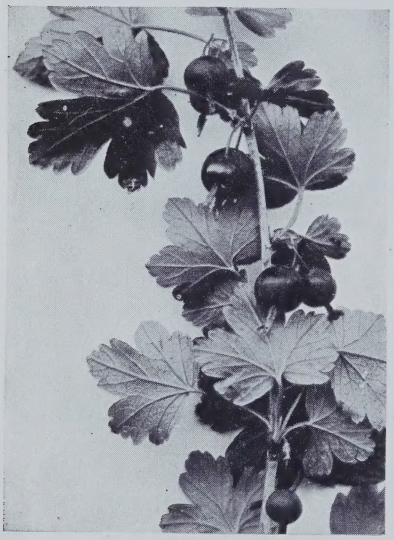

FIG. 71.—Wild gooseberry. Fruit purple-red

FIG. 72.—Pink meadowsweet. Flowers deep pink

Slender saxifrage (*Saxifraga mertensiana*). (Fig. 70.)—Common at high altitudes on wet cliffs or on wet rock slides. Plants 4 to 12

inches high, very hairy; leaves kidney-shaped, coarsely toothed, hairy, 1 to 2 inches broad; petals white, a sixth of an inch long. The stems and leaves are succulent and very brittle.

A few other species of saxifrage occur, but they are inconspicuous plants and not common.

Leather-leaf saxifrage (*Leptarrhena pyrolifolia*).—Common on alpine rock slides and in wet meadows. Plants matted, 4 to 12 inches high, smooth or nearly so; leaves in a rosette at the base of the stem, 1 to 3 inches long, leathery, deep green on the upper surface, pale beneath, blunt-tipped, toothed; flowers in small dense clusters; petals very small, white; stems and seed pods usually deep purplish red.

GOOSEBERRY FAMILY. GROSSULARIACEAE

Wild gooseberry (*Grossularia inermis.*) (Fig. 71.)—Common at low altitudes; on the west slope found as high as Avalanche Lake; usually in woods or thickets. Shrub about 3 feet high, the stems with few or no prickles; flowers greenish, 2 to 4 in each short cluster; fruit deep purplish red. The fruit, which is borne in great abundance, is of excellent flavor when ripe.

FIG. 73.—Mountain spray. Flowers creamy white

Sticky currant (*Ribes viscosissimum*).—Frequent in woods or thickets at low and middle altitudes. An unarmed shrub, 2 to 3 feet high, covered with fine, sticky hairs; leaves 2 to 3 inches wide, rounded, shallowly lobed and with low, rounded teeth; flowers few, greenish, half an inch long; fruit black, covered with sticky glands. The plants are scattered and usually only one is found in a place. The sticky leaves are often densely covered with dust. Very few plants seem to mature fruit.

Spiny currant (*Ribes lacustre*).—Common everywhere in the wooded regions; usually in moist or wet places; common about timber line. A very spiny and prickly shrub, 2 to 4 feet high; leaves often shining; flowers 4 to 10 in a slender raceme, green or purplish; fruit black, with scattered, gland-tipped hairs. The fruit is edible but it is sour and somewhat bitter. The spiny currant is easily distinguished at all times by its very spiny and prickly stems; our gooseberry usually has no spines or prickles on its stems.

ROSE FAMILY. ROSACEAE

Ninebark (*Opulaster malvaceus*).—On rocky, brushy hillsides about Belton. Shrub, 3 to 5 feet high, the bark peeling from the stems in numerous thin layers; leaves alternate, 1 to 2 inches long, broad, shallowly 3 or 5 lobed and with low, rounded teeth; flowers white, half an inch broad, in small, flat-topped clusters; fruit of 2 follicles or "pods." A handsome shrub when in flower; probably occurring elsewhere about the park at low altitudes.

Pink meadowsweet (*Spiraea densiflora*). (Fig. 72.)—Common in the upper part of the timber belt and above timber line, nearly always in meadows. Slender shrub, 1 to 3 feet high; leaves smooth,

FIG. 74.—Prairie cinquefoil. Flowers yellow. Photograph by E. R. Warren

FIG. 75.—Showy cinquefoil. Flowers yellow. Photograph by E. R. Warren

about an inch long, with shallow teeth; flowers very small, in dense clusters, deep pink. One of the most handsome shrubs of the region, often forming rather extensive patches. The flowers are very sweet scented, and their fragrance is noticeable at some distance from the plants. The hardhack of the Eastern States (*Spiraea tomentosa*) is a closely related plant; likewise the various spiraeas which are cultivated as ornamental shrubs.

White meadowsweet (*Spiraea lucida*).—Common at low or middle altitudes, in open places or in woods. Very much like the pink meadowsweet, but lower, 1 to 2 feet high; flowers white, with slight or no odor.

Mountain spray (*Sericotheca discolor*). (Fig. 73.)—Rather rare on the east slope but common on the west slope; in dry, rocky woods

or on open hillsides. Slender shrub, 3 to 6 feet high; leaves 1½ to 3 inches long, hairy on the under side; flowers very small, creamy white, with a rather faint odor, arranged in large panicles. This grows at Sun Camp and there is one large patch near the Many Glacier Chalets. Around Lake McDonald it is a characteristic shrub in the thinner woods. It is very showy and remains in flower a long time.

Cinquefoil (species of the genus *Potentilla*). Many kinds of cinquefoil grow in the park and they are found at all altitudes. They are perennial plants with compound, digitate or pinnate leaves; each leaf consists of 3 or more toothed leaflets; in the digitate leaves the leaflets are all attached at the end of the leafstalk; in the pinnate leaves there is one (or sometimes 3) leaflet at the end of the leafstalk and several others attached lower down along the side of the stalk; the flowers have 5 sepals and 5 bright yellow, notched petals; the fruit is a head of very small, seedlike achenes. The name cinquefoil is derived from the French, *cinque*, five, and *feuilles*, leaves. The plants are known also as five-finger, because the digitate leaves of some species, with their five leaflets, simulate a hand with the fingers spread.

FIG. 76.—Alpine cinquefoil. Flowers yellow. Photograph by A. H. Barnes

Shrubby cinquefoil (*Potentilla fruticosa*). (Pl. V, fig. 1.)—Common at all altitudes, especially on the east slope. A densely branched shrub, 1 to 3 feet high; leaves pinnate, with 3 to 7 small, hairy leaflets; flowers bright yellow, an inch broad or smaller. A handsome shrub, widely distributed in North America, Europe, and Asia. None of our other species of cinquefoil have woody stems.

Prairie cinquefoil (*Potentilla pennsylvanica*). (Fig. 74.)—Common at low altitudes, especially on the east slope; on prairie and dry, open hillsides. Plants 1 to 2 feet high; leaves pinnate; leaflets 5 to 11, grayish green. finely hairy, lobed halfway to the midrib; petals a quarter of an inch long.

Silver-leaf cinquefoil (*Potentilla hippiana*).—Frequent at low altitudes on the east slope, on prairie and open hillsides. Plants 1 to 2 feet high; leaves pinnate; leaflets 7 to 11, 1 to 2 inches long, shallowly toothed, whitish and densely silky-hairy on both sides; petals a third of an inch long.

Cut-leaf cinquefoil (*Potentilla blaschkeana*).—Common at low altitudes, especially on the east slope, in meadows or thickets. Plants 1 to 2½ feet high; leaves digitate; leaflets 5, 2 inches long or larger, deeply divided into narrow lobes, green on the upper surface, densely white-hairy beneath; petals large.

Showy cinquefoil (*Potentilla filipes*). (Fig. 75.)—Common at low and middle altitudes, in thickets or thin woods or on open slopes. Plants 8 to 15 inches high; leaves digitate; leaflets 5, 1 to 2 inches long, toothed, green on the upper surface, white beneath with a close covering of felt-like hairs; petals a third of an inch long.

Green cinquefoil (*Potentilla nuttallii*).—Common at low and middle altitudes, in thickets and on open slopes. Plants 1 to 2 feet high; leaves digitate; leaflets 5, 2 to 3 inches long, toothed about halfway to the midrib, green but hairy on both sides; petals a third of an inch long.

Fig. 77.—White dryad. Flowers white

Meadow cinquefoil (*Potentilla glaucophylla*).—Abundant in alpine meadows and on rock slides. Plants slender, 4 to 12 inches high; leaves pale green, digitate; leaflets 5, one-half to 2 inches long, coarsely and sharply toothed, nearly or quite smooth; petals a third of an inch long.

Alpine cinquefoil (*Potentilla nivea*). (Fig. 76.)—Frequent on alpine rock slides. Plants densely matted, 4 to 8 inches high; leaves digitate; leaflets 3, an inch long or shorter, with rounded teeth, green on the upper surface, densely white-hairy beneath; petals a third of an inch long.

Marshlocks (*Potentilla palustris*).—In sphagnum bogs on the west slope. Plants in general appearance resembling the cinquefoils, 8 to 15 inches high, somewhat hairy; leaves pinnate, the 5 or 7 leaflets pale, 2 to 3 inches long; flowers in loose, flat-topped clusters; petals 5, a quarter of an inch long, red.

Wild strawberry (species of the genus *Fragaria*).—At least 3 species of strawberries are found in the park, at low and middle altitudes; they grow mostly in woods or on open slopes. The wild strawberries are so much like the cultivated ones that most people recognize them at once. Each leaf is composed of 3 large leaflets;

the flower has 5 large, white petals. The fruit of our species, like that of all wild strawberries, is of excellent quality. The pale strawberry (*Fragaria glauca*) is our most common species.

White dryad (*Dryas octopetala*). (Fig. 77.)—Abundant above timber line, chiefly on rock slides. Plants with woody stems, but these prostrate and often forming dense, low mats; leaves an inch long or smaller, green and nearly smooth on the upper surface, densely white-hairy beneath, the margin with low, rounded teeth; flower stems 2 to 6 inches high, the single flower white, its 8 petals half an inch long; fruit a head of achenes ("seeds"), each with a long, feathery tail. In some of the alpine meadows (particularly at Piegan Pass) this is one of the most abundant plants, but in others it is almost or quite lacking. The plants are in flower only a short time but when in full bloom they are very handsome.

Yellow dryad (*Dryas drummondii*).—In alpine meadows and on rock slides, but usually less abundant than the white-flowered species. The leaves are like those of the white dryad but they are rounded at the base, while in the more common plant the leaves are usually slightly notched at the base or else appear to have been cut off straight across. The flowers, however, are very different in the yellow dryad; the petals are erect instead of spreading, and pale yellow.

FIG. 78.—Yellow avens. Flowers yellow

Yellow avens (*Geum macrophyllum*). (Fig. 78.)—Common in wooded portions of the park, along streams or in other moist places. Plants 1 to 2 feet high, very hairy; leaves pinnate, with 5 to 15 toothed leaflets; flowers bright yellow, the petals spreading, a quarter of an inch long; fruit a head of hairy achenes, each one with a long, hooked beak. An unattractive but often conspicuous plant. The hooks of the fruits catch hold of clothing readily.

Purple avens (*Geum rivale*).—Occasional in wet thickets in woods. Plants similar to those of yellow avens; petals erect, pink with deep purple veins, a third of an inch long; calyx purplish.

Thimbleberry (*Rubus parviflorus*). (Fig. 79.)—Abundant in all the wooded portions of the park; often the most conspicuous plant in heavy forest. Shrub, 2 to 4 feet high, with large, maple-like leaves;

petals white, about an inch long; fruit like a raspberry, pale red. One of the most characteristic plants of the park. The fruit is edible, but it is rather dry and its flavor is not very good; it collapses when picked; frequently it hangs on the bushes until it sours.

Red raspberry (*Rubus strigosus*).—Common all over the park, in woods or open places. Shrub, usually 1 to 4 feet high, the stems covered with bristles; leaves with 3 or 5 leaflets, these whitish on the under side; petals white, a quarter of an inch long. The red berries, which begin to ripen in July and may be found up to the end of summer, are of good flavor, but the seeds are very large. On high rock slides the plants are frequently only 4 to 6 inches high; these diminutive bushes often bear several large berries.

FIG. 79.—Thimbleberry. Flowers white

Black raspberry (*Rubus leucodermis*).—Common on the west slope in woods; not seen on the east slope. Shrub, about 3 feet high; stems armed with numerous curved prickles; fruit nearlly black, of excellent flavor.

Wild rose (species of the genus *Rosa*).—Several species of roses are common in the park, growing at nearly all altitudes below timber line. The species are very much alike and it is difficult to distinguish them. They all have handsome pink flowers and red fruit. The only easily recognized species (*Rosa gymnocarpa*) is one growing on the west slope, which may be known by the fact that the sepals soon fall from the fruit, while in other species they remain attached at the upper end.

APPLE FAMILY. MALACEAE

The cultivated apples, pears, and quinces belong to this family.

Service berry (*Amelanchier alnifolia*). (Pl. IV, fig. 1.)—Common at low and middle altitudes, on open slopes or in thin woods and thickets. Shrub, 2 to 5 feet high, nearly smooth; leaves alternate, stalked, toothed, 1 to 2 inches long; flowers white, half an inch long; fruit deep purple, containing several seeds. Known also as june berry and shadbush. Probably the most abundant fruit found in

the park. The fruit, which is edible and sweet, varies greatly in size and quality. Bushes growing in moist places bear very juicy fruit, while that of bushes found in dry, open places contains scarcely any juice. Service berries were gathered in large quantities by the Blackfoot Indians, who used them in stews, soups, etc., or dried them for winter use. Service berries are said to have been their most important vegetable food. The name shadbush is applied to the species found in the Eastern States because the bushes flower in early spring at the time when the shad begin to run.

Mountain ash (*Sorbus sitchensis*). (Fig. 80.)—Common in the wooded portions of the park, extending up to timber line. Shrub,

FIG. 80.—Mountain ash. Flowers white

FIG. 81.—Black hawthorn. Fruit black

with few branches, 3 to 6 feet high; leaves resembling those of sumac, composed of 9 to 13 finely toothed leaflets; flowers white, sweet scented; fruit turning yellow, orange, and finally bright red. A handsome and very conspicuous shrub when loaded with ripe fruit. The fruit is sour and scarcely edible. There are several species of mountain ash which are widely distributed in North America, especially in mountain regions. The mountain ash, of course, is not related to the true ashes (which belong to the Olive Family), none of which grow in Glacier Park.

Black hawthorn (*Crataegus douglasii*). (Fig. 81.)—Abundant on the west slope, especially on lake shores; scarcer on the east slope but plentiful on the shore of St. Mary Lake, and sometimes found on dry hillsides. A thorny shrub or small tree; flowers white, large

and showy; fruit black, juicy, containing several large seeds. The flowers have a strong and rather unpleasant odor. The fruit is edible but its flavor is not particularly good. There are many species of hawthorns, some of which are found in nearly all parts of the United States. In the West they are confined chiefly to the mountains. The hawthorns so extensively used for hedges in England are of the same genus (*Crataegus*).

ALMOND FAMILY. AMYGDALACEAE

The peach and almond are well-known representatives of this family; also the cultivated plums, prunes, and cherries, which belong to the same genus (*Prunus*) as the two shrubs described below.

FIG. 82.—Pin cherry. Fruit red and yellow

Pin cherry (*Prunus corymbulosa*). (Fig. 82.)—Common on the east slope at low and middle altitudes, chiefly on open hillsides. Shrub, 3 to 5 feet high, often forming thickets; leaves 1 to 3 inches long, very finely toothed; flowers small, greenish white; fruit a third of an inch in diameter, red and yellow. The fruit is juicy, but it is extremely bitter.

Western chokecherry (*Prunus melanocarpa*).—Common at low and middle altitudes, in thickets or open places. Shrub, 3 to 5 feet high; leaves alternate, short stalked, 2 to 4 inches long, sharp pointed, smooth, finely toothed; flowers white, a third of an inch broad, in long racemes; fruit dark red, a third of an inch in diameter. Very similar to the eastern chokecherries. The fruit is edible but somewhat bitter. The Blackfoot Indians ate the fruit raw and also used it in soups or, dried and ground (seeds and all), in making pemmican.

BEAN FAMILY. FABACEAE[10]

One of the largest families of plants, the best-known representatives being the cultivated beans and peas, sweet peas, etc. Plants of this group are easily recognized by their flowers, which resemble those of the sweet pea; they have 5 petals. The leaves in all our

[10] The name Leguminosae is often used for the family.

SERVICEBERRY
CAMAS

BLUE FLAX
DWARF LUPINE

species are compound and have entire leaflets; they are *digitate*—of 3 or more leaflets attached at the end of the leafstalk; or *pinnate*—some of the leaflets scattered along the sides of the stalk. The fruit is a legume—a pod more or less like that of the bean or pea, which splits into two parts.

Lupine (species of the genus *Lupinus*). The lupines are among the handsomest flowers of the park, although they are not so abundant here as in some places in the West. They are easily recognized by their digitate leaves, composed of 5 or more narrow leaflets, and by their racemes of blue or purple flowers; the pod is long, narrow, and flattened. The species are difficult to distinguish, but the following are the most common:

Slender lupine (*Lupinus tenellus*).—Abundant in open rocky places or in meadows at low altitudes. Plants 1 to 2 feet high, forming dense, bushy clumps; leaflets very narrow, 1 to 1½ inches long, green and smooth on the upper surface, covered beneath with silky hairs; flowers pale blue, a third of an inch long. Plants with white flowers are sometimes found.

FIG. 83.—Silky lupine. Flowers blue

Silky lupine (*Lupinus flexuosus*). (Fig. 83.)—Common at low and middle altitudes, in meadows or on rocky slopes. Plants bushy, 1 to 2 feet high; leaflets broader, 1 to 2 inches long, densely covered on both sides with silvery, silky hairs; flowers blue, nearly half an inch long.

Dwarf lupine (*Lupinus minimus*). (Pl. IV, fig. 4.)—Common in some of the alpine meadows, especially about Piegan Pass; found also in exposed, rocky places about the east entrance. Plants densely tufted, 4 to 6 inches high; leaflets 5 to 9, half an inch long, densely silky-hairy; flowers blue or purple, a third of an inch long, in a short, dense spike. Easily recognized by the small size of the plants.

Clover (species of the genus *Trifolium*).—There are no native clovers in the park but three European species have been introduced. **Red clover** (*Trifolium pratense*) is common on the west slope but scarce on the east slope. **White clover** (*Trifolium repens*) is frequent at low altitudes; it has creeping stems which root at the joints.

Alsike clover (*Trifolium hybridum*) also is common; it looks almost exactly like white clover, but the stems are taller and more erect and they do not root at the joints.

Pale milk vetch (*Astragalus americanus*). (Fig. 84.)—Common in moist places at low altitudes. Plants 1 to 2 feet high, nearly smooth; leaves pinnate; leaflets 7 to 17, broad, 1 to 1½ inches long, bright green; flowers cream-colored, half an inch long, in dense racemes; pods inflated, nearly an inch long, smooth. The seeds rattle about in the ripe pods.

Slender milk vetch (*Astragalus bourgovii*). (Fig. 85.)—Abundant in alpine meadows and on rock slides. Plants usually in clumps, very slender, 4 to 12 inches high; leaflets numerous, narrow, a third

FIG. 84—Pale milk vetch. Flowers cream-colored

FIG. 85.—Slender milk vetch. Flowers purple

of an inch long, with fine, appressed hairs on both sides; flowers purple, a third of an inch long; pod half an inch long, covered with fine, black hairs. A conspicuous little plant nearly everywhere in high meadows; sometimes found in the timbered areas.

Alpine milk vetch (*Astragalus alpinus*).—Common in alpine meadows and on high rock slides; sometimes in woods at lower altitudes. Stems very slender, often prostrate; leaflets 9 to 13, rounded, smooth on the upper surface, covered with fine, appressed hairs beneath; flowers dirty white, tinged with purple, a quarter of an inch long, few, in a short raceme; calyx finely black-hairy; pod finely hairy, stalked, a third of an inch long.

Loco weed (species of the genus *Oxytropis*).—These are much like the milk vetches, but they may be distinguished by the fact that the

keel (the two united, innermost petals) of the corolla is sharp pointed, not blunt tipped as in the milk vetches. The pods are rather hard, round in cross section, and sharp pointed. The loco weeds are well-known plants in the West because they are poisonous to stock, causing a temporary or permanent derangement of the nervous system. The common loco weed (*Oxytropis lambertii*), with large purple flowers, has not been found in the park.

Hairy loco weed (*Oxytropis splendens*). (Fig. 86.)—Common at low altitudes on the west slope, on prairie or open hillsides. Plants 4 to 8 inches high, usually forming dense clumps, covered with long, soft, white hairs; leaflets very numerous, whorled on the leafstalk; flowers dark purplish blue, nearly half an inch long.

FIG. 86.—Hairy loco weed. Flowers purple-blue

White loco weed (*Oxytropis gracilis*).—Frequent at low altitudes, in meadows and on open slopes. Plants 6 to 12 inches high, growing in clumps, thinly hairy, green; leaflets 21 to 31, sharp pointed, an inch long or shorter, not whorled; flowers in dense spikes, dirty white, half an inch long.

Alpine loco weed (*Oxytropis alpicola*).—Abundant in alpine meadows and on rock slides. Like the common white loco weed but a smaller plant, only 2 to 4 inches high.

Wild licorice (*Glycyrrhiza lepidota*).—Common in low, open, sandy or rocky places at Belton and the east entrance. Coarse, weedy plant, 1 to 3 feet high, smooth or nearly so; leaves pinnate; leaflets 11 to 19, blunt tipped, an inch long, dotted with dark glands; flowers yellowish white, half an inch long, in dense spikes; pod half an inch long, covered with hooked prickles. The fruit reminds one of a cocklebur. The roots of another plant of this genus (*Glycyrrhiza glabra*), a native of Asia and southern Europe, furnish the licorice of commerce.

Yellow hedysarum (*Hedysarum sulphurescens*). (Fig. 87).—Common on the east slope at nearly all altitudes, usually in open places. Plants 1 to 1½ feet high (in alpine meadows often lower), smooth or nearly so; leaves pinnate; leaflets 11 to 15, about an inch long; flowers pale yellow, half an inch long, in loose racemes; pods long and flat, scalloped on both edges. The fruit is very different from

that of our other plants of this family. When in flower, the plants resemble some of the milk vetches.

Pink hedysarum (*Hedysarum americanum*).—Occasional at low aititudes. Distinguished from the yellow hedysarum by having pink or purple flowers.

American vetch (*Vicia americana*).—Common in woods and thickets at low altitudes. A slender, smooth plant, climbing by means of tendrils which are produced at the tip of the leaf; leaves pinnate; leaflets 8 to 12, an inch long or shorter; flowers bluish purple, half an inch long or somewhat larger.

White vetchling (*Lathyrus ochroleucus*). (Fig. 88.)—Frequent at low altitudes in woods or thickets. Plants slender, climbing by

FIG. 87.—Yellow hedysarum. Flowers pale yellow

FIG. 88.—White vetchling. Flowers creamy white. Photograph from Mrs. William Warren

tendrils at the ends of the leaves; leaflets 6 or 8, 1 to 2 inches long, smooth, pale on the underside; flowers creamy white, half an inch long.

GERANIUM FAMILY. GERANIACEAE

The cultivated geraniums are the best-known members of the family. They are of African origin and do not belong to the genus *Geranium* but to *Pelargonium*, a closely related group.

Purple geranum (*Geranium viscosissimum*). (Fig. 89.)—Common on the east slope, chiefly at low altitudes, on open or brushy, rocky hillsides, in thin woods, in aspen thickets, etc.; not seen on the west slope. A common and very showy plant in many places; plants

very sticky because of the presence of numerous gland-bearing hairs; stems usually 1 to 2 feet high, commonly forming dense clumps; flowers about 1½ inches broad, deep, rich rose-purple. The leaves, like those of our other species, turn bright red in late summer.

White geranium (*Geranium richardsonii*).—Occasional at low altitudes on the east slope, as about the entrance, at St. Mary, etc., chiefly in aspen thickets. A slender plant, not viscid like the purple geranium, with white flowers somewhat smaller than in that species.

FLAX FAMILY. LINACEAE

Blue flax (*Linum lewisii*). (Pl. IV, fig. 2.)—On prairie and open rocky hillsides at low altitudes, common in some places; sometimes

FIG. 89.—Purple geranium. Flowers purple

FIG. 90.—Mountain lover. Flowers greenish

reaching subalpine meadows, as, for example, about Cracker Lake. A handsome plant, and attractive because of the beautiful blue of its flowers. It is very similar to the cultivated flax (*Linum usitatissimum*). It remains in flower only a short time, and the fruiting plants are inconspicuous because of their slender habit and small, pale leaves.

BITTERSWEET FAMILY. CELASTRACEAE

The best-known representatives of this family in the United States are the shrubby climbing bittersweet (*Celastrus scandens*) of the East, and the strawberry bush or waahoo (*Euonymus*), species of which are found in the Eastern States and in California.

Mountain lover (*Pachystima myrsinites*). (Fig. 90.)—Abundant on the west slope in dense or thin woods, thickets, etc.; common on the east side about the entrance and around Sun Chalets, but in some places, as about Lake McDermott, very rare. Low shrub, 6 inches to nearly 2 feet high, erect or often nearly prostrate; leaves evergreen, usually less than an inch long, deep green, the margins shallowly toothed; flowers very small, greenish, clustered in the axils of the leaves; fruit a small capsule. In spite of its abundance in some localities, this plant is little noticed, doubtless because it has no very distinctive characters. The leaves, however, are rather handsome. In the Many Glacier region the plant was found only on the trail to Granite Park, where it forms a few small patches.

FIG. 91.—Buckthorn. Fruit black

FIG. 92.—Deerbrush. Flowers white

MAPLE FAMILY. ACERACEAE

Mountain maple (*Acer glabrum*).—Common at low and middle altitudes. Shrub, 3 to 6 feet high, forming clumps or thickets, or frequently a slender tree 20 feet high, with smooth, pale gray bark; leaves shallowly or deeply lobed, or sometimes lobed to the base; flowers small and green. A characteristic shrub of the park, recognizable by its resemblance to other maples. The leaves vary greatly in shape and size; in autumn they turn bright red.

BUCKTHORN FAMILY. RHAMNACEAE

Buckthorn (*Rhamnus alnifolia*). (Fig. 91.)—Common on both slopes and on the east slope often very abundant, growing at nearly

all altitudes up to timber line; found most commonly on dry rocky hillsides, where it often forms extensive thickets, but occurring also in woods and even in swamps. A sparsely branched shrub, usually 2 to 3 feet high, with bright green, finely toothed, nearly smooth leaves; flowers small and inconspicuous, greenish, solitary or clustered in the axils of the leaves; fruit a third of an inch in diameter or smaller, black, juicy, very bitter, and not edible. A characteristic shrub of the park but rarely noticed by visitors. The leaves turn yellow in late summer. The name buckthorn is not particularly appropriate since the plant is not spiny. A closely related species of the Pacific coast (*Rhamnus purshiana*), which extends to western Montana but

FIG. 93. — Wild hollyhock. Flowers pink. Photograph by Fred H. Kiser, Portland, Oreg.

FIG. 94.—Silverberry. Fruit silvery green

has not been found in the park, furnishes the "cascara sagrada," which is a well-known drug.

Deerbrush (*Ceanothus velutinus*). (Fig. 92.)—Common in many localities on both slopes at low and middle altitudes, usually on dry, open slopes but sometimes in woods. A densely branched shrub, 2 to 3 feet high, often forming dense thickets; leaves alternate, 1½ to 3 inches long, very finely toothed, smooth on the upper surface and appearing as if varnished, pale beneath and finely hairy; flowers very small, white, in small dense clusters; fruit a dry, 3-lobed capsule. A rather handsome plant when in flower, but the flowers appear early in the season and last only a short time.

Some of the Pacific coast species of *Ceanothus* have blue flowers, and are known as California lilac or mountain laurel. One white-

flowered species is very common in the Central and Eastern States; it is called New Jersey tea, because the leaves were used as a substitute for Chinese tea during the Revolutionary War.

MALLOW FAMILY. MALVACEAE

Wild hollyhock (*Sphaeralcea rivularis*). (Fig. 93.)—A showy and handsome plant, found at low altitudes, most frequently in moist places but often on brushy hillsides or among aspens. The coarse, hairy stems are 2 to 5 feet high and very leafy; the beautiful large, pale pink flowers are clustered in the axils of the upper leaves; the dry fruit separates into numerous sections somewhat like those of an

FIG. 95.—Canada buffalo berry. Fruit red

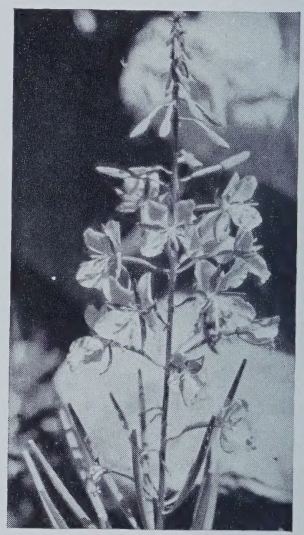

FIG. 96. — Fireweed. Flowers magenta

orange. The wild hollyhock remains in flower only a short time but is very attractive when in full blossom. The stiff hairs of the plant are its one unpleasant feature, for they penetrate the skin almost as easily as cactus spines. The wild hollyhock is closely related to the common cultivated hollyhock.

ST. JOHN'S-WORT FAMILY. HYPERICACEAE

St. John's-wort (*Hypericum scouleri*).—Frequent above timber line, on moist banks or along streams. Plants smooth, 4 to 10 inches high; leaves in pairs along the stem, not stalked or toothed, dotted with black glands; flowers bright yellow, clustered at the top of the stem, half an inch broad; petals 5; stamens numerous. A very hand-

some and conspicuous plant of alpine meadows. The flower buds are beautifully tinged with deep red.

VIOLET FAMILY. VIOLACEAE

Violets are too well known to need description. Most of those which grow in the park bloom before the tourist season opens but scattered plants are sometimes found in flower late in the season.

FIG. 97.—Tall cottonweed. Flowers white or pink

Canada violet (*Viola canadensis*).—Common in woods at low and middle altitudes. Plants with slender leafy stems 6 to 12 inches high; leaves broad, abruptly short-pointed, nearly smooth; flowers white inside, veined with purple, the petals yellow at the base.

Marsh violet (*Viola palustris*).—Frequent at low altitudes, especially on the west slope; in wet thickets or woods and in sphagnum bogs. Plants stemless, developing slender runners; leaves smooth, pale green, rounded heart-shaped, the margins with fine, close, rounded teeth; flowers small, white or pale lilac. The flowers are inconspicuous; they may be found in early or late summer.

FIG. 98.—Devil's-club. Fruit red

Tall yellow violet (*Viola glabella*).—Common at all altitudes, in moist woods or high meadows. Stems leafy, 4 to 8 inches high; leaves kidney-shaped or heart-shaped, 2 to 3 inches wide, smooth or nearly so; flowers bright yellow. The most showy violet found in the park, often forming great patches on moist banks. At low elevations the flowers appear in spring, but they may be found all through the summer in alpine meadows from which the snow has recently melted.

Stemless yellow violet (*Viola orbiculata*).—Common in the wooded portions of the park, usually on banks in deep woods. Plants stem-

less, producing short runners; leaves round, dark green, finely hairy on the upper side, usually lying nearly flat on the ground; flowers small, yellow. This species blooms so early that visitors seldom see the flowers. The rosettes of leaves are conspicuous in summer, however, and they remain green through the winter.

Purple violet (*Viola nephrophylla*).—In moist soil at low altitudes on the west slope, and perhaps also on the east slope. Leaves heart-shaped, smooth, blunt at the tip; flowers large, purple.

FIG. 99.—Cow parsnip. Flowers white

OLEASTER FAMILY. ELAEAGNACEAE

Silverberry (*Elaeagnus commutata*). (Fig. 94.)—At low altitudes on both slopes, but more common on the east slope; occurring on open, rocky hillsides and along streams in the low, open valleys. A stiff shrub, rarely more than 6 feet high; leaves alternate and entire, closely covered with small, silvery scales; flowers yellowish, small, solitary or clustered in the axils of the leaves; fruit nearly dry, half an inch long or smaller, covered with silvery scales, containing a single large stone. Few visitors notice this plant, but it is abundant in some places, as along the automobile road near St. Mary, where it forms extensive gray thickets. It occurs more sparsely on slopes above Many Glacier Chalets and on rocky hillsides at Belton.

Canada buffalo berry (*Lepargyrea canadensis*). (Fig. 95.)—Distributed throughout the park and at nearly all altitudes; usually in woods but often in thickets, on open slopes, or even on prairie. A stiff shrub, usually about 3 feet high, branched from the ground; leaves opposite, entire, green on the upper surface, covered beneath with silvery and brownish scales; flowers small and inconspicuous, brown and yellow, clustered at the joints of the branches, appearing in spring; fruit bright red, translucent, a quarter of an inch long

or smaller, containing a single seed. Early in the season this characteristic shrub is little noticed, but when the fruit matures in midsummer it becomes one of the most beautiful and conspicuous plants of the park. The fruit reminds one of the currant, because of its color; when first taken in the mouth its flavor is strongly acid but after a moment it becomes intensely bitter. The Canada buffalo berry is common throughout the Rocky Mountain region and occurs also in the Northwestern States and eastward to New York and Maine. The Latin name used for it by some botanists is *Shepherdia canadensis*.

FIG. 100. — Yellow angelica. Flowers greenish yellow

FIG. 101.—Red-osier dogwood. Flowers white

EVENING PRIMROSE FAMILY. ONAGRACEAE

The plants of this family are herbs with alternate or opposite leaves; the flowers are small or large and usually have 4 sepals and 4 petals.

Fireweed (*Epilobium angustifolium*). (Fig. 96.)—Abundant at low and middle altitudes, usually in open places. Plants 2 to 5 feet high, smooth or nearly so; leaves narrow, willow-like, pale on the under side, the margins not toothed; flowers magenta, 1 to 1½ inches broad; fruit a long, slender pod. Probably no other plant furnishes so large a proportion of the color seen in the park. Fireweed is usually abundant wherever aspens grow, and the display of it along the automobile road is particularly brilliant. This species is widely distributed in the United States but in the East it

is rarely plentiful. The common name is given because it is one of the first plants to spring up on burned-over areas. This is due to the fact that the seeds each bear a tuft of hairs so that they are easily carried by the wind.

Alpine fireweed (*Epilobium latifolium*). (Pl. I.)—Common above timber line on rock slides and along brooks; frequently found along gravelly stream beds at lower altitudes. Plants 4 to 12 inches high, smooth, pale green on both sides; leaves 1 to 2 inches long; flowers few, rose or magenta, 1 to 2 inches broad. The flowers are so much like those of common fireweed that the plant is easily recognized. The finest display seen by the writer was along Appekunny Creek, where great masses of the plants lined the banks with vivid color. At high altitudes the plants are more scattered and less showy.

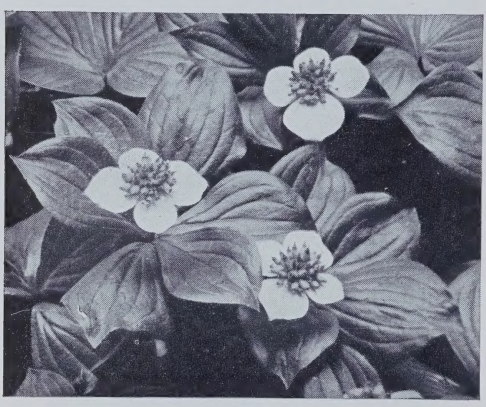

FIG. 102.—Bunchberry. Flowers white

Cottonweed (species of the genus *Epilobium*).—Although these plants belong to the same genus as the fireweed, their flowers are so small that the relationship is not always recognized. The petals are only a sixth to a quarter of an inch long; the leaves are opposite and have entire or finely toothed margins; the seeds bear a tuft of hairs or "cotton" at one end, hence the common name. **Tall cottonweed** (*Epilobium adenocaulon*, fig. 97) is common all through the timbered area in moist places; the stems are 1 to 2 feet high, and the flowers are white or pale pink. **Alpine cottonweed** (*Epilobium alpinum*) is abundant in wet places above timber line; the plants are only 3 to 6 inches high, and have white flowers. **Purple alpine cottonweed** (*Epilobium anagallidifolium*) is abundant in the same sort of situations; the plants are 2 to 5 inches high, and have deep purple flowers. The last two species are handsome because the flowers are large for the size of the plant. Several other kinds of cottonweed are found in the park but it is very difficult to distinguish them.

GINSENG FAMILY. ARALIACEAE

The well-known ginseng (*Panax quinquefolium*) belongs to this family, but it is not found in the Western States.

Wild sarsaparilla (*Aralia nudicaulis*).—Common on the west side of the park, usually in low places in deep woods but found also in

drier woods and on open or brushy slopes. A nearly stemless plant with long, thick rootstocks; leaf only one, composed of several large, finely toothed leaflets; flower stalk shorter than the leaf and often hidden by it, bearing a few umbels of small, greenish flowers; fruit a purplish black, juicy berry about a quarter of an inch long, not edible. A characteristic plant of the Lake McDonald region but not observed on the east slope. The leaves turn deep red in autumn. The rootstock is used in medicine; it has properties similar to those of true sarsaparilla, which is obtained from tropical American plants of the genus *Smilax*.

Devil's-club (*Echinopanax horridum*). (Fig. 98.)—An abundant and characteristic plant of the west slope but very rare or absent

FIG. 103.—Pipsissewa. Flowers pink

FIG. 104.—Pink pyrola. Flowers pink. Photograph by E. R. Warren.

on the east side; occurring chiefly in deep woods, most frequently along streams or in low places. Shrub, usually 3 to 4 feet high, most commonly with simple stems; stems and under surface of the leaves very prickly; flowers small, greenish white, in small, rounded umbels which are arranged in large panicles; fruit small, bright scarlet, juicy, very abundant and forming a large, dense, club-like panicle. The devil's-club is one of the most showy shrubs of the park, and is quite unlike any other plant. It often forms extensive thickets along streams, and because of the plant's sharp prickles these are almost impenetrable. Devil's-club is abundant in the forests of the Pacific slope from Oregon to Alaska and is found also about Lake Superior and in Japan.

PARSLEY FAMILY. APIACEAE[11]

Cultivated parsley, celery, parsnips, and carrots belong to the family. A rather large number of plants of the group are found in the park but it is difficult to distinguish them; they are much alike in general appearance and few attract attention.

Cow parsnip (*Heracleum lanatum*). (Fig. 99.)—Abundant at low and middle altitudes, usually in woods; sometimes found above timber line. Plants 3 to 6 feet high, very hairy; leaves broad, with few leaflets; flowers white; fruit flat, rounded, a third of an inch long. Our most showy member of this family, a stately plant, often associated with the thimbleberry; flowering in early summer. The Indians of the Northwest use the young shoots in spring for food. The guides in the park often give the name of the plant as "sacred rhubarb," a name derived from the fact that the plant is used in some of the ceremonials of the Blackfoot Indians.

FIG. 105.—One-sided pyrola. Flowers white

White angelica (*Angelica lyallii*).—Common at low and middle altitudes, usually in woods. A coarse plant, 2 to 4 feet high, much like the cow parsnip in general appearance but not at all hairy; leaflets more numerous and smaller; flowers white; fruit a quarter of an inch long or smaller.

Yellow angelica (*Angelica dawsoni*). (Fig. 100.)—Frequent in woods or meadows near or below timber line. Plants slender, 1 to 2½ feet high, smooth; flowers greenish yellow; fruit a fifth of an inch long. Although this rather handsome plant belongs to the same genus as the white angelica, it does not much resemble the latter in general appearance. The large, toothed bracts at the base of the flower cluster are a distinctive characteristic.

DOGWOOD FAMILY. CORNACEAE

The flowering dogwood (*Cornus canadensis*) of the East is the best-known American plant of this family. It does not reach the Western States, but a similarly showy species is found in the for-

[11] The name Umbelliferae also is used for the family.

ests of the Pacific coast. The water gum, sour gum, and tupelo of the Southern and Eastern States also belong to the dogwood family.

Red-osier dogwood (*Cornus stolonifera*). (Fig. 101.)—Common at nearly all altitudes below timber line, in woods or on open slopes, especially in moist or wet places; often forming clumps or extensive thickets. Shrub, 3 to 6 feet high, with smooth, slender, reddish branches; leaves opposite, entire, 1 to 4 inches long; flowers small, white, 4-parted, in flat, broad, dense clusters; fruit small, white or pale blue, one-seeded, juicy but not edible. A common shrub, very unlike the flowering dogwood of the East, but handsome in either flower or fruit. The leaves are beautifully colored with red in autumn. This species, as well as several closely related ones, is found in nearly all parts of the United States.

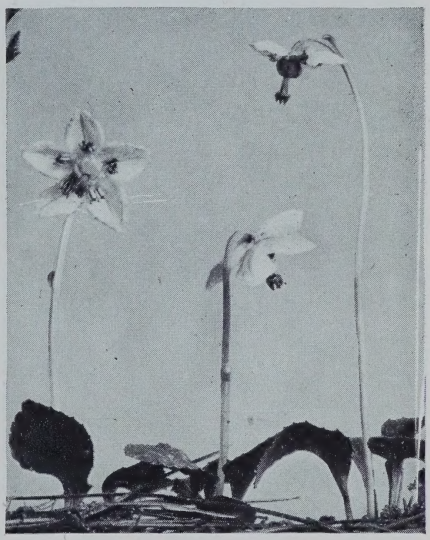

FIG. 106.—Wood nymph. Flowers white

Bunchberry (*Cornus canadensis*). (Fig. 102.)—Common on the west slope, in thin or deep woods, on open brushy slopes, and about sphagnum bogs; rare on the east side, and seen by the writer only in the wooded swamps below Lake McDermott. A herbaceous plant, 2 to 8 inches high; leaves 4 to 6 in a whorl at the top of the stem; fruit a cluster of small, bright red berries. This plant is very different from the dogwood described above, so different, in fact, that some botanists place it in a distinct genus. The flowers, which resemble those of the flowering dogwood, are so arranged as to deceive the careless observer. The flowers are really very small; they are collected in a dense head which is surrounded by four large, petal-like, white bracts which are half an inch long. The head of flowers with its bracts is usually mistaken for a single flower with four petals, but careful examination will prove that this is not the case. The leaves are handsomely colored with red in autumn.

PYROLA FAMILY. PYROLACEAE

Low plants with mostly evergreen leaves; flowers with 5 sepals and 5 petals; fruit a rounded capsule containing many minute seeds.

Pipsissewa (*Chimaphila umbellata occidentalis*). (Fig. 103.)—Frequent in deep, well-drained woods. Stems 4 to 8 inches high; leaves 1 to 3 inches long, leathery, sharply toothed, shining; flowers waxy, pink. This plant is widely distributed in the United States. The Blackfoot Indians formerly used the leaves for smoking, like tobacco.

Pyrola[12] (species of the genus *Pyrola*). Small plants with broad, usually shining leaves clustered at the base of the stem; flowers drooping or curved downward, arranged in a loose raceme; fruit (the young fruit may be seen in the center of the flower) bearing at the top a thick, short or long, column-like style. These plants are often known as shinleaf, a meaningless name; and as wintergreen, but this name is unfortunate since they are not very closely related to the wintergreen plant which furnishes wintergreen oil.

FIG. 107.—Indian pipe. Plant white. Photograph by Asahel Curtis

Pink pyrola (*Pyrola asarifolia*). (Fig. 104.)—Common in woods. Plants 4 to 12 inches high, smooth; leaves rounded, 1 to 2 inches broad, dark or light green, shining or dull; flowers half an inch broad, pink or purplish. The plants are in flower only a short time.

White pyrola (*Pyrola chlorantha*).—Frequent in moist woods. Similar to the pink pyrola but the leaves smaller, usually less than an inch wide, dark green, not shining, on very long stalks; flowers greenish white.

Spotted pyrola (*Pyrola picta*).—Found by the writer only in woods at Sun Camp, but doubtless occurring elsewhere. Easily distinguished by the leaves, which are decidedly longer than broad, sharp pointed, and streaked or mottled with silvery white on the upper side; flowers greenish white or tinged with purple.

One-sided pyrola (*Pyrola secunda*). (Fig. 105.)—Common in moist or dry woods, often forming large masses. Plants 3 to 6 inches high; leaves pale green, usually pointed, very finely toothed; flowers white or greenish white, the petals a sixth of an inch long. Easily recog-

[12] Pronounced pŷr′-ō-lă.

nized by the one-sided arrangement of the flowers. This species is widely distributed in the United States.

Small pyrola (*Pyrola minor*).—Rare; in moist woods or under shrubs near timber line. Plants 3 to 6 inches high; leaves rounded, an inch long or smaller; flowers white or dull pink. Differing from the one-sided pyrola in its rounded, deep green leaves, and from all the other pyrolas in having a very short style.

Wood nymph (*Moneses uniflora*). (Fig. 106.)—Occasional on mossy banks in woods. Plants 1 to 3 inches high, smooth; leaves clustered at the base of the stem, rounded, a third to three-fourths of an inch broad, finely toothed; flower one, waxy white, half an inch broad, with yellow stamens. A delightful little plant, so small that one has to search for it carefully; of rather rare occurrence but often covering moss carpets with its pure white, saucer-shaped flowers.

FIG. 108.—Menziesia. Flowers greenish yellow and bronze. Photograph from Mrs. William Warren

INDIAN PIPE FAMILY. MONOTROPACEAE

The plants of this family are saprophytes—that is, they subsist upon decaying vegetable matter. Unlike plants which obtain their food from the soil and air, they have no green coloring matter and their leaves are reduced to scales.

Indian pipe (*Monotropa uniflora*). (Fig. 107.)—Of frequent occurrence on the west side of the park and to be expected also on the east side; found in low, moist places in deep woods. The plants are white and appear as if molded from wax; the stems are usually clustered; the one large flower is recurved but the seed pod is held erect; after flowering the plant turns black. The Indian pipe is known also as ghost flower or corpse plant. It is widely distributed in North America and is found in Japan and the Himalayas.

Pinesap (*Hypopitys latisquama*).—This has been gathered in woods about the east entrance and is to be looked for elsewhere. It is a pink plant, similar in general form to the Indian pipe but each stem bears several flowers. The plant has a characteristic violet-like odor.

Pinedrops (*Pterospora andromedea*).—Found by the writer in dry woods near Going-to-the-Sun Chalets, and doubtless occurring in other places. A reddish or brownish plant, 6 inches to 2 feet high, covered with short, very sticky hairs. Each stem bears numerous flowers arranged in a long raceme. The flowers are white and only a quarter to a third of an inch long.

HEATH FAMILY. ERICACEAE

Shrubs (sometimes very small) with alternate or opposite, usually evergreen leaves; flowers with 4 or 5 sepals; petals usually all united to form a saucer-shaped or bell-shaped corolla.

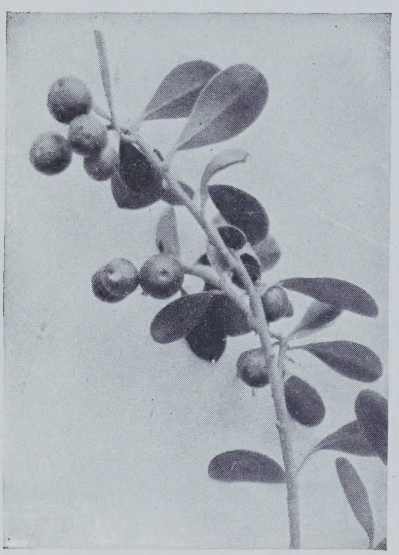

FIG. 109.—Bearberry. Fruit red

FIG. 110.—Red heather. Flowers rose red. Photograph by Asahel Curtis

Labrador tea (*Ledum glandulosum*).—Common in woods about Belton. Shrub, 1 to 3 feet high; leaves evergreen, one-half to 1½ inches long, pale on the under side, not toothed; flowers white, a quarter of an inch long, with 5 petals, borne in dense clusters. Very handsome when in flower; the flowers appear in early summer.

Menziesia (*Menziesia glabella*). (Fig. 108.)—Abundant nearly everywhere in woods; common about timber line. Slender shrub, 2 to 5 feet high; leaves deciduous, 1 to 2 inches long, pale green, nearly smooth; flowers urn-shaped, a quarter of an inch long, greenish yellow and bronze; seed pod a quarter of an inch long, 3-lobed. The flowers are rather attractive but not showy. The bushes often form dense thickets on thinly wooded or open hillsides. The name

Menziesia was given to the plant in honor of its discoverer, Archibald Menzies, one of the earliest botanists to visit the northwest coast.

Rocky Mountain laurel (*Kalmia microphylla*).—Common in alpine meadows; also in sphagnum bogs on the west slope. Small shrub, 4 to 12 inches high, smooth; leaves opposite, one-fourth to 1 inch long, evergreen, leathery, green on the upper side, whitish beneath; flowers saucer-shaped, half an inch broad, rose-red or magenta. A beautiful little plant, often very abundant in grassy meadows. The flower has 10 stamens whose anthers at first are held in tiny pockets in the outspread corolla; but if the corolla is struck gently the stamens will fly out of the pockets and stand erect. The flowers last only a short time. The common mountain laurel of the Eastern States (*Kalmia latifolia*) is a much larger plant of the same genus; it is not found in the West.

FIG. 111.—Tall whortleberry. Fruit dark blue

Creeping wintergreen (*Gaultheria humifusa*).—Frequent in alpine meadows. A very small plant, the short, slender stems creeping over the ground; leaves evergreen, rounded, half an inch long or smaller, very finely toothed; flowers bell-shaped, pink, an eighth of an inch long; fruit bright red, fleshy, an eighth of an inch in diameter. An inconspicuous plant, easily overlooked. The flowers are usually hidden under the leaves.

FIG. 112.—Androsace. Flowers white. Photograph from Mrs. William Warren

Bearberry (*Arctostaphylos uva-ursi*). (Fig. 109.)—Abundant at low and middle altitudes in woods or on open slopes. Shrub with prostrate branches; leaves evergreen, very thick, an inch long; flowers urn-shaped, a sixth of an inch long, white or pink; fruit bright red, mealy, with insipid flavor.

Often very abundant on steep, rocky slopes, forming great mats which are so slippery that it is difficult to walk over them. The plant is used for Christmas greens in the West. In autumn the leaves are colored with red and bronze. The plant is known also as kinnikinnick. The fruit varies greatly in size; it was used by the Indians for food, and the leaves were smoked like tobacco. Grouse also eat the berries. Bearberry has a wide distribution in North America and grows in Europe and Asia.

Red heather (*Phyllodoce empetriformis*). (Fig. 110.)—Common in alpine meadows. Shrub, 4 to 12 inches high; leaves evergreen, needle-like, half an inch long; flowers rose-red, a third of an inch long. Red heather is easily among the half dozen finest flowers of the park and anything more beautiful than the great patches about Iceberg Lake, Grinnell Glacier, and Sperry Glacier can hardly be imagined. Unfortunately the graceful bell-shaped blossoms do not last long. The rounded seed pod is dark red, and covered with beautiful minute, golden glands. Our red heather is different from the true heather (species of *Erica*) of Europe, although both belong to the same family and are somewhat similar in general appearance. Red heather is common in the mountains of the Northwest and is one of the showy flowers of Mount Ranier.

FIG. 113.—Shooting-stars. Flowers rose-purple

White heather (*Phyllodoce glanduliflora*).—Common in many of the alpine meadows; scarce in some places but in others abundant. Similar to the red heather but with yellowish white flowers. The plant is far less showy than the red heather and the flowers are not attractive. It is the common species at Sexton Glacier, Piegan Pass, and Gunsight Pass, but at Iceberg Lake it is scarce or absent.

BLUEBERRY FAMILY. VACCINIACEAE

Blueberries, whortleberries, and huckleberries, the most important members of this family, are widely distributed in North America. They grow, however, mostly in acid soil, consequently they are scarce or altogether absent in large areas which are underlain by limestone. The western whortleberries are usually known locally as huckleberries, but the name huckleberry belongs properly to plants of the genus *Gaylussacia*, none of which are found in the West. Huckleberries

SHRUBBY CINQUEFOIL
BUTTERWORT

ELEPHANT-HEAD
RED WHORTLEBERRY

have large, hard seeds while blueberries and whortleberries have very small ones. The cranberry also belongs to this family.

Tall whortleberry (*Vaccinium membranaceum*). (Fig. 111.)—Common in all or most of the wooded portions of the park and very abundant in many localities. Shrub, usually 2 to 3 feet high; leaves 1 to 2 inches long, sharp pointed, very finely and closely toothed, green on both sides; flowers solitary in the axils of the leaves, small, bell-shaped, pinkish white, appearing in spring; fruit large, purplish black. This is the only whortleberry found in the park whose fruit is of importance. The berries are of excellent quality, very juicy, rather tart, and with such small seeds that they appear to be seedless. The whortleberry is the finest fruit found in the park and it is much appreciated by all who make its acquaintance. It is easily separated from the other berries of the region by the curious depression at the top of the fruit. The fruit begins to ripen about the middle of July and may be found at the higher altitudes until frost occurs. It makes excellent pies and is even better when eaten fresh with sugar or with sugar and cream. The individual fruits vary greatly in size, shape, and color; usually they are depressed globose but frequently they are pear shaped; normally they are purplish black at maturity but on some plants they are deep wine red. Plants growing in deep, moist woods have larger and better flavored fruit than those in thin or dry woods.

FIG. 114.—Blue gentian. Flowers deep blue

Dwarf whortleberry (*Vaccinium myrtillus*).—Common at nearly all altitudes; chiefly in heavy woods but often in dense or open thickets. A densely branched, spreading shrub, 6 inches to one foot high, with slender, green, angled branches; leaves about half an inch long, green, finely toothed; fruit very small, bluish black. A very common and characteristic little shrub, especially in spruce and fir woods. The fruit is of good flavor but so small as to be almost worthless.

Red whortleberry (*Vaccinium scoparium*). (Pl. V, fig. 4.)—Very common in thin or dense woods, especially on the west slope; usually

occurring at high altitudes. A densely branched shrub, similar in general appearance to the dwarf blueberry but with smaller (about a quarter of an inch long) leaves and wine-red fruit. The fruit is not very plentiful and although of good flavor is too small to be eaten.

Canada blueberry (*Vaccinium canadense.*)—Found only about Belton, in the flat woods between the railroad and the lake; there abundant. Shrub, 1 to 2 feet high, very hairy throughout; leaves 1 to 1½ inches long, sharp pointed, not toothed; fruit small, pale blue, sweet. Easily distinguished from our other blueberries by having the flowers and fruits clustered rather than solitary.

FIG. 115.—Small gentian. Flowers lavender

FIG. 116.—Pink dogbane. Flowers pink

PRIMROSE FAMILY. PRIMULACEAE

Androsace[13] (species of the genus *Androsace*). (Fig. 112.)—Two species of *Androsace* grow in the park in alpine meadows or in open places at low altitudes; the species are separated only by unimportant characters. They are small plants, 1 to 4 inches high, with rosettes of small, narrow, finely toothed leaves; the flower stems bear numerous slender-stalked flowers, all attached at the end of the stem; the corolla is white, 5-lobed, about an eighth of an inch broad.

Shooting-star (*Dodecatheon pauciflorum*). (Fig. 113.)—Common in alpine meadows and often in wet places at low altitudes. Plants 3 to 12 inches high, smooth; leaves all in a rosette at the base of

[13] Pronounced ăn-drŏs'-ā-cē,

the stem, 2 to 3 inches long, pale green, not toothed; flowers rose-purple, with a yellow eye, half an inch long.

GENTIAN FAMILY. GENTIANACEAE

The fringed gentians which are so abundant in Yellowstone Park do not grow in Glacier Park.

Blue gentian (*Gentiana calycosa*). (Fig. 114.)—Abundant in meadows above timber line and frequently found in open places at lower altitudes. Stems smooth, 4 to 10 inches high, usually bearing only one flower; leaves an inch long; flowers deep blue, about an inch and a half long. Almost unrivaled in beauty among the flowers of Glacier Park is this gentian, which spreads great sheets of intense blue in alpine meadows. The plants are found in flower almost throughout the summer.

FIG. 117.—Jacob's-ladder. Flowers violet

Prairie gentian (*Gentiana affinis*).—In low places on the prairie at the east entrance. Plants 5 to 12 inches high, forming clumps; leaves narrower than in the common blue gentian; flowers bluish purple, an inch long. This plant is less showy than the one found at high altitudes.

Small gentian (*Gentiana acuta*). (Fig. 115.)—In marshes or wet thickets at low and middle altitudes. Stems solitary, 6 to 12 inches high, with few branches, smooth; leaves 1 to 2 inches long; flowers lavender, about half an inch long. The plants are seldom common and they are far less showy than those of the other species.

DOGBANE FAMILY. APOCYNACEAE

Pink dogbane (species of the genus *Apocynum*).—Two species of pink dogbane are common at low and middle altitudes, usually in open, rocky places. The **smooth dogbane** (*Apocynum ambigens*, fig. 116) has smooth leaves, while the **hairy dogbane** (*Apocynum pumilum*) has the leaves hairy on both sides. They are bushy herbs, 1 to 2 feet high; leaves rounded, 1 to 2 inches long; flowers bell-shaped, a quarter of an inch long, pale pink, striped within with deep pink. The stems contain a milky juice. In late summer the leaves turn bright yellow. Both these dogbanes have very beautiful

flowers. Another species, the green-flowered dogbane, a taller plant with inconspicuous, greenish white flowers, is found in a few places.

PHLOX FAMILY. POLEMONIACEAE

Jacob's-ladder (*Polemonium parvifolium*). (Fig. 117.)—Common at nearly all altitudes, in brushy places or on open, rocky slopes; most abundant at high altitudes. Plants 4 to 12 inches high, minutely hairy and somewhat sticky; leaves with 11 to 25 rounded leaflets a quarter of an inch long or smaller; flowers bell-shaped, a third of an inch long, violet. The leaflets are arranged along the leafstalk in such a way as to suggest a ladder, hence the common name. Some of the species found in other parts of the West have much larger flowers.

FIG. 118.—Blue phacelia. Flowers purple-blue

Skunk plant (*Polemonium viscosissimum*).—Common on high rock slides. Plants densely tufted, extremely sticky, 4 to 8 inches high; leaves with very numerous small, whorled leaflets; flowers purple, an inch long, in heads or short spikes. Easily recognized by the strong skunklike odor of the plant. The flowers are more showy than in the Jacob's-ladder, but they last only a short time.

WATERLEAF FAMILY. HYDROPHYLLACEAE

Blue phacelia (*Phacelia lyallii*). (Fig. 118.)—Common at high altitudes, chiefly above timber line; often abundant and conspicuous on rock slides. A perennial plant, usually 3 to 8 inches high, forming small, dense tufts; leaves green, deeply lobed; flowers a third of an inch long, deep purplish blue, with long, protruding stamens. It blooms rather late in summer.

Silky phacelia (*Phacelia sericea*).—Of common occurrence but usually at lower altitudes than the last; often found on dry, open hillsides just above the plains region. It closely resembles the blue phacelia, but the leaves are more deeply divided and they are covered with whitish, silky hairs. The plant also blooms earlier in the season.

White phacelia (*Phacelia leucophylla*).—Common nearly everywhere in the park in open or brushy places, ranging from the plains

up to the highest alpine rock slides. The leaves, unlike those of the other two species, are not at all toothed or lobed; they are lance-shaped and densely covered with fine, stiff, gray hairs; the flowers are dirty white. The plant forms small or large clumps, and remains in bloom a long time. Although often conspicuous, especially on rock slides, it is an unattractive plant.

Mist maiden (*Romanzoffia sitchensis*). (Fig. 119.)—Common at high altitudes, near or above timber line, in crevices of moist cliffs. A delicate perennial plant with a bulblike base; leaves green, about an inch broad, rounded and lobed, smooth and somewhat fleshy; flowers white or pinkish white, a quarter to a third of an inch long. In general appearance this resembles some of the saxifrages, but it has a corolla of united petals, while in the saxifrages the corolla consists of 5 separate petals. The plant reaches the southern limit of its range in Montana.

FIG. 119.—Mist maiden. Flowers white. Photograph from Mrs. William Warren

BORAGE FAMILY. BORAGINACEAE

Besides the plants enumerated below, species of several other genera have been collected about the park, but they are inconspicuous or infrequent plants and are not likely to be noticed. The fruit in this family consists of four small nutlets in the bottom of the calyx; the corolla is 5-lobed.

Bur forget-me-not (*Lappula diffusa*). (Fig. 120.)—Common in all the wooded portions of the park. A perennial, usually about 2 feet high, with narrow, entire, alternate, hairy leaves; flowers a quarter of an inch broad, bright or pale blue, with a yellow eye; nutlets covered with barbed prickles. A beautiful plant with flowers much like those of the cultivated forget-me-not. Although it is generally distributed, it is most showy and most noticed when it grows about the low clumps of shrubs near timber line, for here the flowers seem to develop an intenser shade of blue than elsewhere. The ripe nutlets adhere to clothing very tenaciously.

Wild forget-me-not (*Myosotis alpestris*).—Found only near and above timber line, in alpine meadows. In general appearance much like the bur forget-me-not, but the plants are smaller, usually less

than a foot high, and the nutlets are not prickly. It is a very handsome plant but does not remain in flower long. It is closely related to the common cultivated forget-me-not (*Myosotis scorpioides*), which is a native of Europe.

MINT FAMILY. MENTHACEAE

This family is often known by the name Labiatae. The plants usually have 4-sided stems and opposite leaves; commonly, but not always, they have a mint-like odor. There are many species of them in the United States but there are only a few in Glacier Park.

Heal-all (*Prunella vulgaris*). (Fig. 121.)—Common on both slopes but chiefly at low altitudes; usually growing on moist banks in

FIG. 120.—Bur forget-me-not. Flowers blue

FIG. 121.—Heal-all. Flowers violet-purple

woods or at the edges of streams and lakes. Known also as self-heal or carpenter weed. A hairy perennial, 4 to 12 inches high; leaves shallowly toothed; flowers violet-purple, nearly half an inch long. The plant has no mint odor. It grows commonly in nearly all parts of North America as well as in Europe and Asia.

American mint (*Mentha canadensis*).—Common at low altitudes in moist or wet ground; frequent about both entrances and about Lake McDonald; a good many plants were growing in 1919 about the front of Many Glacier Hotel. Easily recognized by its characteristic mint odor; the small pink flowers are clustered in the axils of the leaves. Peppermint (*Mentha piperita*) and spearmint (*Mentha spicata*) are closely related.

Horsemint (*Monarda menthaefolia*). (Fig. 122.)—Frequent at low altitudes on the east slope and about Belton; on open rocky slopes, on prairie, and in aspen thickets. A finely hairy perennial, 1 to 2 feet high, with a strong, pleasant odor; leaves shallowly toothed, sharp pointed; flowers large and showy, an inch long, purplish rose. Various species of horsemint, much alike in general appearance, are widely distributed in the United States.

FIGWORT FAMILY. SCROPHULARIACEAE

In addition to the plants discussed below, species of several other genera are found in the park, but most of them are rare or inconspicuous. **Common mullein** (*Verbascum thapsus*) is rather frequent about Belton and scattered plants are found here and there through the park.

FIG. 122.—Horsemint. Flowers purple-rose

Yellow beardtongue (*Pentstemon confertus*). (Fig. 123.)—Common at low and middle altitudes, often extending nearly up to timber line; usually in open or rocky places, sometimes on prairie or even in woods. The leaves are smooth and entire; the pale yellow flowers are less than half an inch long; the anthers are smooth. This is the least conspicuous of any of our species of beardtongue but it is not unattractive. In the plants of the genus *Pentstemon* each flower has five stamens but one of the stamens is always sterile, that is, it bears no anther. The sterile stamen is long and slender and usually has a tuft of hairs at the upper end, hence the name "beardtongue." Species of *Pentstemon* are very numerous in the Rocky Mountains and other Western States but they are rare in the East. They are very beautiful plants with white, blue, purple, or bright red flowers.

Blue beardtongue (*Pentstemon virens*).—In general appearance much like the yellow beardtongue; the flowers are of about the same size, but in color they are an intense blue. Frequent on the east slope, but the plants are scattered; usually on open slopes among spruce trees.

Purple beardtongue (*Pentstemon lyallii*).—Common at middle and high altitudes, often above timber line; on open grassy slopes and on rock slides. Similar to the alpine beardtongue but the plants

taller, about a foot high, forming dense, bushy clumps; leaves not stalked, 2 to 4 inches long, very narrow, nearly smooth; flowering branches covered with very short, sticky hairs; flowers 1½ to nearly 2 inches long, pale purple; anthers white-woolly. One of the showiest and most beautiful plants of the park. One plant with white flowers was found near Cracker Lake. A closely similar species (*Pentstemon linearifolius*) with very hairy leaves grows on rocky slopes and shale slides about the east entrance and in the Many Glacier region.

Alpine beardtongue (*Pentstemon ellipticus*).—Common near and above timber line, usually on rock slides. Plants about 6 inches high, often forming dense mats 2 feet across or even larger; leaves short-stalked, somewhat leathery, blunt or rounded at the tip;

FIG. 123.—Yellow beardtongue. Flowers pale yellow

FIG. 124.—Alpine speedwell. Flowers blue

flowering branches covered with short, sticky hairs; flowers 1½ inches long, purple or violet-purple; anthers woolly. Of all the showy plants found on rock slides none is more handsome than this, with its great masses of deeply colored blossoms. In spite of their large size, the flowers are very graceful as they sway in the wind.

Yellow monkey flower (*Mimulus caespitosus*).—Very abundant near and above timber line, in wet soil along brooks or about pools; sometimes extending well down along streams, a few plants being found even about the east entrance. Plants commonly about 6 inches high, growing in dense clumps or in mats, smooth or finely hairy; leaves succulent, the lower ones short-stalked; flowers about an inch long, bright yellow. The leaves always have a fresh appearance, but the flowers wilt quickly after they are picked.

Muskflower (*Mimulus moschatus*) is a similar plant, but its stems are long and weak and lie flat upon the ground; the flowers are only half an inch long and are not conspicuous. It grows in wet places in the woods near Sun Camp and Snyder Lake.

Red monkey flower (*Mimulus lewisii*).—Common and often abundant at high altitudes; chiefly in wet meadows and along streams above and just below timber line. Along streams the plants often grow at much lower altitudes, and there is a fine display of them along Appekunny Creek, near Many Glacier Hotel. Plants 12 to 18 inches high, covered with weak, sticky hairs,; leaves 1½ to 3 inches long, toothed; flowers 1½ to 2 inches long, crimson or rose-red. This species is common along the Pacific coast. The plants do not remain in flower long.

Alpine speedwell (*Veronica alpina*). (Fig. 124.)—Frequent in meadows above timber line and occasionally found at lower altitudes. Plants 4 to 8 inches high, unbranched, soft-hairy; leaves an inch long or shorter, shallowly toothed or entire; flowers bright blue, a fifth of an inch broad; fruit a flat capsule, notched at the top. An attractive little plant but often overlooked because it is half hidden by the grasses and sedges among which it grows. Plants with pink flowers are found occasionally. Several other kinds of speedwell grow in the region, but they have inconspicuous flowers.

FIG. 125.—Yellow Indian paintbrush. Flowers greenish yellow

Indian paintbrush (*Castilleja rhexifolia*, *C. miniata*, and other species).—Half a dozen species of the red Indian paintbrushes grow in the park, but they are all so much alike that the most experienced botanists have difficulty in distinguishing them, and their differences are of no interest to most people. They are one of the half dozen most showy plants and are found at all altitudes, but they are most abundant in the meadows above and just below timber line. They are often the most conspicuous feature of the meadows; indeed, they and the purple fleabane are usually the most characteristic plants of such places. The Indian paintbrushes are mostly parasites upon the roots of other plants. They are easily recognized by their narrow, alternate leaves and dense flower spikes.

The flowers, however, are small, or at least narrow, and green; and the plants owe their showy appearance to the brightly colored bracts which inclose the flowers. In color the bracts range through almost every shade of scarlet and crimson. The different shades are not peculiar to certain species but the same remarkable variation in color may be found in the plants of any one species. Scattered individuals of species whose bracts are normally crimson or scarlet often have white, pink, orange, or even yellow bracts. The Indian paintbrushes are characteristic plants of the western mountains and there are many species of them, but only one species is found in the eastern United States.

FIG. 126.—Indian warrior. Flowers greenish yellow or purplish

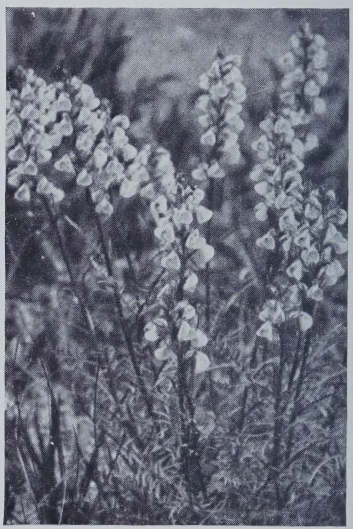

FIG. 127.—Alpine lousewort. Flowers yellowish white. Photograph by A. H. Barnes

Yellow Indian paintbrush (*Castilleja occidentalis*). (Fig. 125.)—Very similar to the red-bracted plant but distinguished by having greenish-yellow flower bracts. Usually, too, the plants are only about 6 inches high, while in the other species they are rarely less than a foot high. The yellow Indian paintbrush grows on rock slides and in grassy meadows above timber line.

Indian warrior (*Pedicularis bracteosa*). (Fig. 126.)—Common everywhere in woods, and in brushy places above timber line. Plants 1 to 3 feet high, smooth, the stems unbranched; leaves deeply lobed; flowers nearly an inch long, greenish yellow or purplish. A characteristic plant of spruce woods. Although it belongs to the same genus (*Pedicularis*) as the elephant-head, the flowers are very different in form, and the corolla has no beak.

Elephant-head (*Pedicularis groenlandica*). (Pl. V, fig. 2.)—Common in wet meadows along streams and lakes in forested areas and in moist meadows above timber line. Plants 8 to 20 inches high, smooth; leaves alternate, deeply lobed; corolla a third to half an inch long, deep reddish purple or claret. If the flowers are examined closely their resemblance to an elephant's head is seen to be most striking, the long beak of the corolla being upcurved and strongly suggestive of an elephant's trunk. This curious plant is common in the Rocky Mountain region and on the Pacific coast and extends far northward.

FIG. 128.—Northern bedstraw. Flowers white

FIG. 129.—Highbush craneberry. Fruit red

Alpine lousewort (*Pedicularis contorta*). (Fig. 127.)—Common on rock slides and in meadows above timber line; sometimes found on moist open slopes at lower altitudes. Plants 8 to 15 inches high, tufted, smooth; leaves deeply lobed; flowers half an inch long, yellowish white, the corolla with a curved beak. The plants remain in flower for a long time. The name lousewort, evidently a translation of the Latin generic name *Pedicularis*, is applied to plants of this genus for no obvious reason.

Another species of lousewort (*Pedicularis racemosa*) is of occasional occurrence in woods on both slopes. Its rather showy flowers are like those of the alpine lousewort, but the leaves, instead of being deeply lobed, are shallowly toothed.

BLADDERWORT FAMILY. PINGUICULACEAE

Butterwort (*Pinguicula vulgaris*). (Pl. V, fig. 3.)—Not common, but found in wet places at various altitudes. Plants very succulent; leaves in a rosette at the base of the stem, 1 to 2 inches long, blunt-tipped, with entire margins; flower stems 1½ to 4 inches high, bearing one flower; flower rich purple, half an inch broad, 2-lipped, with a long spur at the base. The color and shape of the flower strongly suggest a violet. The fleshy leaves are covered with glands which make them seem greasy to the touch, hence the name of butterwort. By means of these sticky glands the leaves entrap insects which are used for food.

FIG. 130.—Snowberry. Fruit white

FIG. 131.—Twinflower. Flowers pink. Photograph from E. T. Wherry

MADDER FAMILY. RUBIACEAE

Northern bedstraw (*Galium boreale*). (Fig. 128.)—Common in woods and open places at all altitudes. Plants 6 to 15 inches high, smooth; leaves an inch long, in whorls of 4; flowers very small, white, sweet scented; fruit hairy. The large clusters of delicate flowers are conspicuous throughout the summer. This species is widely distributed in North America, Europe, and Asia.

Sweet bedstraw (*Galium triflorum*).—Common in moist woods or thickets. Stems slender and brittle, with very rough edges; leaves in whorls of 6, 1 to 2 inches long; flowers very small, greenish-white; fruit covered with hooked hairs. The plants, especially when dry, have a sweet, vanillalike odor. The fruits are easily detached and cling to clothing.

HONEYSUCKLE FAMILY. CAPRIFOLIACEAE

The common wild and cultivated honeysuckles (of the genus *Lonicera*) are the best-known representatives of the family.

Highbush cranberry (*Viburnum pauciflorum*). (Fig. 129.)—Of rare occurrence on the west slope and apparently not found on the east side of the park; rather plentiful at Avalanche Lake in woods and thickets, and also lower down in moist places in woods along the Avalanche trail; a few bushes seen along the lake near Lewis's. Shrub, 3 to 5 feet high; leaves opposite, stalked, shallowly lobed, green but somewhat hairy; flowers small, white, in small clusters; fruit bright red, a third of an inch in diameter. The fruit is edible

FIG. 132.—Black twinberry. Fruit black

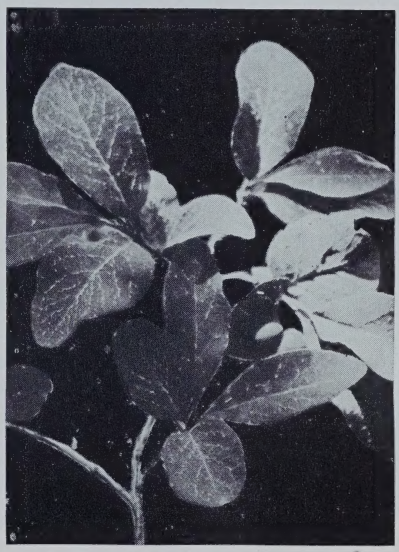

FIG. 133.—Red twinberry. Fruit red

and has a pleasant acid flavor; in some localities where the plant is abundant it is gathered and used as a substitute for cranberries. Other species of *Viburnum* are widely scattered in North America, especially in the eastern portion, one of the best known being the black haw (*Viburnum prunifolium*). The cultivated snowball also belongs to the genus *Viburnum*.

Snowberry (*Symphoricarpos albus*). (Fig. 130.)—Common everywhere at low and middle altitudes; in heavy or thin woods, in thickets, and frequently in open places. Slender shrub, 2 to 4 feet high; leaves opposite, about an inch long, nearly or quite smooth, normally entire but on young shoots often toothed or lobed; flowers bell-shaped, a quarter of an inch long, clustered in the axils of the

leaves, deep pink; fruit clear white, a third of an inch long, containing 2 seeds. This and other species of snowberry are widely distributed in the United States, and this one is often cultivated as an ornamental shrub. It is very handsome when loaded with the ripe fruit, which is juicy but not edible. The plants remain in flower a long time, and flowers and ripe fruit often may be found upon the same bush. There are two species of snowberry in the park which are very similar in general appearance. This one is much the more common. It has stamens shorter than the corolla, while the other species (*Symphoricarpos occidentalis*) has the stamens somewhat projecting from the corolla.

FIG. 134. — Valerian. Flowers white. Photograph by Asahel Curtis

FIG. 135.—False dandelion. Flowers yellow or orange. Photograph by Albert Haanstad, Denver, Colo.

Twinflower (*Linnaea borealis*). (Fig. 131.)—Abundant on the west slope, in thin or deep woods. Branches very slender, trailing over the ground and forming loose mats; leaves evergreen, rounded, half an inch long or smaller; flowers pink, a quarter to half an inch long, 2 on each slender flower-stalk. The twinflower was the favorite of the great Swedish botanist Linnaeus, and he selected it from all the plants known to him to be named in his honor. Most people will commend his choice, for the flowers possess a delicacy and a modest beauty that are found in few other plants.

Black twinberry (*Lonicera involucrata*). (Fig. 132.)—Common in woods at low and middle altitudes. A stout shrub, 2 to 5 feet high, slightly hairy; leaves 2 to 5 inches long, with entire margins; flowers

2 or 3 on a slender stalk, greenish yellow, half an inch long; fruit black, juicy. Sometimes known as swamp honeysuckle, and in Montana as skunk berry. The fruit has an unpleasant flavor. There are usually two flowers or fruits on each stalk, and they are surrounded by large, leaflike bracts, which are red or purple in age.

Red twinberry (*Lonicera utahensis*). (Fig. 133.)—Common in woods at low and middle altitudes. Shrub, 2 to 3 feet high, smooth; leaves 1 to 2 inches long, pale green, with entire margins; flowers 2, on a slender stalk, pale yellow, 2-lipped, three-quarters of an inch long; fruit bright red. The fruit is translucent and has an insipid flavor; the 2 berries of each pair are usually very unequal in size.

FIG. 136. — Rattlesnake-root. Flowers white

FIG. 137.—White hawkweed. Flowers white

Elderberry (*Sambucus melanocarpa*).—Common in all the wooded parts of the park, extending up to timber line; usually in moist or wet soil and often in swamps. Shrub, 3 to 5 feet high, the stems mostly unbranched but often in large clumps; leaves opposite, each composed of 5 or 7 leaflets, these 2 to 6 inches long, coarsely toothed, sharp pointed; flowers very small, white, sweet scented, in small rounded clusters; fruit black, containing 3 to 5 seeds. The elderberry is a well-known plant, for the various species are found in nearly all parts of the United States. The fruit begins to ripen the last of July; it is tart and edible, and it may be eaten raw, but is usually made into pies or jam. The stems contain a large amount of pith which can be removed easily, and children often take advantage of this fact in order to make popguns from the branches.

The flowers are not very showy; they usually appear early in summer, but in 1919 some bushes were in bloom at Morning Eagle Falls as late as the middle of August.

VALERIAN FAMILY. VALERIANACEAE

Valerian (*Valeriana sitchensis*). (Fig. 134.)—Abundant in meadows above timber line and sometimes found at lower altitudes. Plants 1 to 2 feet high, smooth; leaves composed of 3 to 7 large, succulent leaflets; flowers white or pinkish, a third of an inch long, in broad, dense clusters. One of the most abundant and showy plants of subalpine meadows. The very sweet-scented flowers have suggested the name of wild heliotrope, which is used in some books. The large, thick roots have a strong and characteristic odor.

FIG. 138. — Goldenrod. Flowers yellow. Photograph by Fred H. Kiser, Portland, Oreg.

HAREBELL FAMILY. CAMPANULACEAE

Harebell (*Campanula rotundifolia*). (Pl. III, fig. 2.)—Common at all altitudes. A slender plant, 4 to 12 inches high, nearly smooth; stem leaves very narrow, those at the base of the stem rounded; flowers purple or blue-purple, often nearly an inch long. Although the harebell is found all through the park, it is such a graceful and beautiful plant that one never seems to tire of it as one does of certain flowers which, although no more frequent and showy, seem to force their beauty upon one. The harebell has a wide distribution in North America, Europe, and Asia, and our plant is the true "bluebells of Scotland."

CHICORY FAMILY. CICHORIACEAE

The plants of this family are often placed with the Aster Family in one group, to which the name Compositae is given. The structure of the flower head is the same as in the Aster Family (see p. 97), but in the Chicory Family each flower of the head has a long, strap-shaped corolla, like the common dandelion. The plants are distinguished also by having milky juice; in the Aster Family the juice is colorless.

Dandelion (*Taraxacum vulgare*).—The common dandelion, which is a native of Europe, has been introduced at many places in the park.

Alpine dandelion (*Taraxacum monticola*).—In alpine meadows or on rock slides; not common. Easily recognized by its close resemblance to the common dandelion, although a much smaller plant.

False dandelion (species of the genus *Agoseris*). (Fig. 135.) Several species grow in the park, at all altitudes, but it is difficult to distinguish them. They resemble the common dandelion, having rosettes of leaves at the base of the naked flower-stalk, but they are distinguished by having smooth achenes or "seeds"; in the dandelion the "seeds" are very rough. Some of the false dandelions have bright yellow flowers, but others have bronze or orange ones.

Rattlesnake-root (*Prenanthes sagittata*). (Fig. 136.)—Common in swamps and moist woods at low and middle altitudes. Plants 8 to 20 inches high, smooth; leaves toothed or lobed; flowers pure white. An attractive but not conspicuous plant.

Tall hawkweed (*Hieracium columbianum*).—Frequent in dry places at low or middle altitudes. Plants 1 to 2 feet high, hairy below; stem leaves slightly hairy, 3 to 4 inches long, shallowly toothed; flowers bright yellow, the heads few, an inch broad. The plants are scattered and only one or two are found in a place; they flower in late summer.

FIG. 139.—Smooth aster. Flowers pale blue

Hairy hawkweed (*Hieracium albertinum*).—Common on dry, rocky slopes at low and middle altitudes. Plants 6 to 15 inches high, densely covered with very long, soft, white hairs; flowers bright yellow. A handsome plant because of the contrast between the bright yellow flowers and the dense covering of white hairs.

White hawkweed (*Hieracium albiflorum*). (Fig. 137.)—Common in woods or open places. Plants slender, 1 to 3 feet high, very hairy; flowers white, in numerous small heads. A weed-like plant, found nearly everywhere.

ASTER FAMILY. ASTERACEAE

The largest family of plants, well represented in Glacier Park. The group is often known by the name Compositae, or composites. The plants are easily recognized by the form of the flower heads, which are like those of a daisy or sunflower. People who have never examined a sunflower carefully usually assume that it is a single flower, but this is not the case. Each of the so-called "flowers" is really a cluster of small flowers, surrounded at the base by

bracts, which suggest a calyx. The central flowers of the head (disk flowers) are small and inconspicuous, but the outermost flowers of the head usually have a large petal-like corolla, which is known as a ray. If a daisy or sunflower head is torn apart this structure is easily seen. Each head contains numerous "seeds" (achenes), which often have a tuft of hairs at the top. Besides the plants listed below, species of several other genera are found in the park.

Goldenrod (species of the genus *Solidago*). (Fig. 138.)—Several species of goldenrod grow in the park, at all altitudes. It is difficult to distinguish them and few people will be interested in attempting to do so. Those species which grow at low altitudes

FIG. 140.—Rough aster. Flowers violet

FIG. 141.—Showy fleabane. Flowers purple

are mostly tall, coarse plants, but those found on alpine slopes are dwarf and frequently only 2 to 6 inches high. The goldenrod is one of the best-known of North American plants, and the species (of which there are 100 or more) are found in nearly all parts of the continent. It has been generally believed that the pollen from their flowers is one of the causes of hay fever but the best authorities now state that this is erroneous.

Aster (species of the genus *Aster*). A number of kinds of asters grow in the park but, as in the case of the goldenrods, it is difficult to distinguish them. They are found at all altitudes. They are low or tall plants with medium-sized flower heads, which have white, pink, purple, or lavender rays. Several species besides those listed below are found in the park.

Smooth aster (*Aster laevis*). (Fig. 139.)—Common at low altitudes in open places. Plants 1 to 2 feet high, pale green, perfectly smooth throughout; leaves with entire margins; rays pale blue. Easily recognized by the smooth stems. This is the aster which is so abundant along the automobile road on the east side of the park.

Purple aster (*Aster frondeus*).—Similar to the smooth aster, but the stems more or less hairy; leaves somewhat toothed; rays purple or pale purple. The commonest aster of the park, found nearly everywhere below timber line.

Swamp aster (*Aster sayianus*).—Common in low thickets. Easily recognized by the large (2 to 3 inches long), thin leaves with entire margins; rays bright purple; stems not branched, 1 to 2½ feet high, usually purple-red.

Rough aster (*Aster conspicuus*). (Fig. 140.)—Common at low and middle altitudes in open or brushy places. Plants 1 to 2 feet high; leaves 3 to 6 inches long, thick and very rough; rays violet. One of our most showy asters.

FIG. 142.—Pussy toes. Flowers white

Pink aster (*Aster engelmannii*).—Common in the wooded portions of the park. Plants 1½ to 4 feet high, smooth or nearly so; leaves 2 to 4 inches long, their margins usually entire; rays few, widely separated from each other, pale pink. A very handsome plant. One of the common species in the Many Glacier region.

Alpine aster (*Aster meritus*).—Abundant on rock slides and high rocky slopes; sometimes found along streams at lower altitudes. Plants 3 to 6 inches high, usually matted, the branches often lying on the ground; leaves 1 to 2 inches long, nearly smooth, the edges somewhat toothed; flower heads one or few on each stem; rays bright purple or violet. A very showy species, often conspicuous above timber line.

Fleabane (species of the genus *Erigeron*).—Known also as daisy, but this name is better reserved for the little European daisy, which belongs to a different genus. A rather large number of species of fleabane grow in the park and those listed below are only the most common ones. They resemble asters, but usually the flower heads

have more numerous rays (50 to 100), and the green bracts which surround the head are narrower.

Showy fleabane (*Erigeron salsuginosus*). (Fig. 141.)—Abundant in high meadows. Stems 8 to 15 inches high, nearly smooth, each usually bearing a single head; leaves with entire margins, rays rather few (50 to 70), purple or violet. This and the red Indian paintbrush furnish a large proportion of the vivid color of alpine meadows.

Smooth fleabane (*Erigeron macranthus*).—Common at low and middle altitudes, in thickets or on open slopes. Similar to the showy fleabane, but the stems usually bearing several heads; rays more

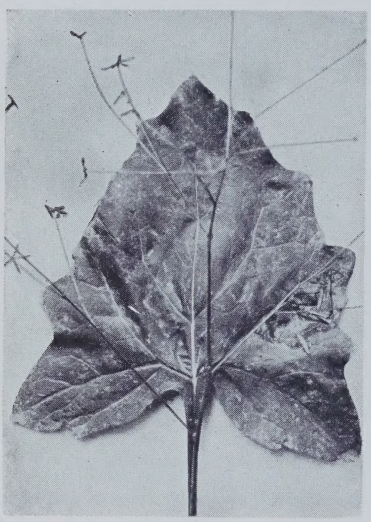

FIG. 143.—Pathfinder. Flowers white

FIG. 144.—Pearly everlasting. Flowers white and pale yellow

numerous, very narrow, purplish or bluish. **Hairy fleabane** (*Erigeron conspicuus*) is a similar plant of low altitudes, distinguished by very hairy stems and leaves.

White fleabane (*Erigeron caespitosus*).—Common on open, usually dry, rocky slopes at low altitudes. Stems 4 to 6 inches high, in clumps; leaves narrow, finely hairy; flower heads few, with white rays.

Cut-leaf fleabane (*Erigeron compositus*).—Occasional on rock slides and in alpine meadows. Leaves divided into numerous narrow lobes; stem 1 to 3 inches high, bearing a single head with small white or pink rays. Many of the plants have flower heads without rays.

Pussy toes (species of the genus *Antennaria*). (Fig. 142.)—Low plants, the stems and leaves white with matted hairs; flower heads small, with no rays. Several species of pussy toes, most of them very much alike, grow in the park. They are found at all altitudes but are most abundant above timber line. The flowers are whitish and the heads are usually not very conspicuous. One species, **pink pussy toes** (*Antennaria rosea*), is a rather handsome plant because the heads are surrounded by bright pink bracts. In the Central States species of *Antennaria* are known commonly as Indian tobacco, and children often chew the leaves.

Pathfinder (*Adenocaulon bicolor*). (Fig. 143.)—Common in woods on the west slope; scarce on the east slope, but growing at Sun Camp and probably elsewhere. Plants slender, 1 to 3 feet high; leaves 3-cornered, 2 to 6 inches long, green on the upper side, white beneath, with matted, white hairs; flower heads very small, the flowers pure white; rays none. An unattractive, weedy plant, but so abundant in some places that it is likely to receive attention. The plant appears green until the leaves are overturned. A person walking through a patch of the plants makes a trail that is well marked by the white under surfaces of the leaves that are thus exposed, hence the common name. The "seeds" are very sticky and have an annoying habit of clinging to one's clothing.

FIG. 145.—Brown-eyed Susan. Flowers brown and yellow. Photograph by Albert Haanstad, Denver, Colo.

Pearly everlasting (*Anaphalis margaritacea*). (Fig. 144.)—Common at low and middle altitudes, in woods or open places. Plants 8 to 18 inches high, covered with white, matted hairs; flower heads small, surrounded by pearly-white bracts, without rays, the flowers pale yellow.

Balsam root (*Balsamorrhiza sagittata*).—Common on open slopes at low and middle altitudes. Leaves mostly clustered at the base of the plant, long-stalked, heart-shaped or arrow-shaped, 4 to 8 inches long, covered on both sides with close, matted, white hairs; flower stem 1 to 2 feet high, bearing a single large head; rays yellow, an inch long. The flower heads resemble those of a sunflower. The large roots contain much resin, but they were used by the Indians for food.

Brown-eyed Susan (*Gaillardia aristata*). (Fig. 145.)—Common in open places at low and middle altitudes and frequently found even above timber line. Plants 1 to 2 feet high, somewhat hairy; leaves lobed or toothed; flower heads few, the heads purplish brown, the large rays yellow, or brownish near the base, 3-lobed at the tip. A very showy plant, often seen in cultivation. It is frequently known as blanket flower.

Yarrow (*Achillea lanulosa*). (Fig. 146.)—Common at all altitudes. Plants 4 to 20 inches high; flower heads small, white. Easily recognized by the finely cut, plume-like leaves, which have a strong odor like that of tansy. This is a western species, but

FIG. 146.—Yarrow. Flowers white

FIG. 147.—Arnica. Flowers yellow. Photograph by E. R. Warren

it is little different from the one (*Achillea millefolium*) which grows in the East.

Sweet coltsfoot (*Petasites sagittata*).—In wet meadows or bogs at low altitudes on the east slope; at St. Mary, and also in higher meadows at Grinell Lake. Leaves all at the base of the stem, arrow-shaped and 3-cornered, 6 to 12 inches long or larger, green on the upper side, white beneath, finely toothed; flower heads few, on a stout, naked stalk, large, with short, white rays. The plant blooms so early that it is not likely to be found in flower by visitors, but the large leaves are conspicuous.

Arnica (species of the genus *Arnica*). (Fig. 147.)—Arnicas are the most showy of the yellow flowers of the park, and they are common everywhere in woods and alpine meadows. There are many

species of them, which are very difficult to distinguish. The most showy one (*Arnica latifolia*), with large, heart-shaped leaves, is abundant in early summer in heavy woods. The **alpine arnica** (*Arnica alpina*), with narrow leaves, is very conspicuous above timber line. All the species have erect stems with a few pairs of leaves; the flower heads are solitary or few, rather large, and have few long, broad, yellow rays. The arnica used in medicine is obtained from one of the European arnicas, and in the Montana species the roots have a strong flavor of arnica.

FIG. 148.—Arrowhead ragwort. Flowers yellow

Ragwort (species of the genus *Senecio*).—Smooth or hairy plants with scattered leaves; flower heads small or of medium size, with few bright yellow rays. The following are the most common species of the park.

Arrowhead ragwort (*Senecio triangularis*). (Fig. 148.)—Common in moist woods and in high meadows. Plants 1½ to 4 feet high, smooth; leaves narrowly triangular, 2 to 8 inches long, toothed. A showy plant, found in flower nearly all summer long. It is particularly abundant about timber line, especially near snow banks, and often forms large dense patches.

FIG. 149.—Alpine ragwort. Flowers yellow

Showy ragwort (*Senecio megacephalus.*)—Frequent at middle and high altitudes, usually on open, rocky slopes. Plants 1 to 2 feet high, in dense clumps, white-woolly; leaves long-stalked, lance-shaped, 2 to 8 inches long; flower heads 1 to 3 on each stalk, about an inch high, the rays nearly an inch long. Easily recognized by the large heads.

White-leaf ragwort (*Senecio canus*).—Frequent at nearly all altitudes, on rocky slopes or in meadows. Plants tufted, 8 to 12 inches high; leaves rounded or oblong, 1 to 3 inches long, covered on both sides with matted, white hairs; flower heads numerous, nearly half an inch high.

Alpine ragwort (*Senecio fremontii*). (Fig. 149.)—Abundant above timber line on rock slides and open slopes. Plants bushy, smooth, 4 to 6 inches high; stems very leafy; leaves rounded, an inch long or shorter, coarsely toothed; heads few, a third of an inch high. One of the most handsome and conspicuous plants of alpine slopes.

Green ragwort (*Senecio burkei*).—Common at low altitudes, in wet woods, thickets, or meadows or along streams. Plants slender, 1 to 2 feet high, bright green, nearly smooth; leaves at base of stem oval or oblong, 2 to 3 inches long, finely toothed; stem leaves deeply lobed; flower heads numerous, nearly half an inch high.

FIG. 150.—Meadow ragwort. Flowers yellow

Meadow ragwort (*Senecio ovinus*). (Fig. 150.)—Common above timber line, in wet meadows and on rocky slopes. Plants tufted or matted, 2 to 6 inches high, smooth; leaves at base of stem rounded, half an inch long, with few low, rounded teeth; heads few, a third of an inch long. A common and rather showy plant.

Rock ragwort (*Senecio conterminus*).—Occasional on the highest rock slides and exposed summits. Similar to the last, but plants somewhat white-woolly; leaves thick and fleshy; flower head usually one on each stem, nearly half an inch high.

White thistle (*Cirsium hookerianum*).—Common nearly throughout the park. Easily recognized by the very spiny leaves, and the large, spiny heads of dirty white flowers. Above timber line the plants are sometimes less than a foot high, but at lower altitudes they are often 4 feet high.

Pasture thistle (*Cirsium lanceolatum*).—Flowers reddish purple. The pasture thistle is a noxious weed of European origin, and in many parts of the United States is a serious pest. Only a few plants have been seen on the east slope of the park, but on the west slope, unfortunately, the thistle is very abundant at low altitudes.

INDEX

	Page
Abies	14
Acer	66
Achillea	102
Actaea	41
Adder's-tongue family	5
Adder-tongue	22
Adenocaulon	101
Adiantum	7
Agoseris	97
Alder	31
Allium	22
Almond family	60
Alnus	31
Alpine fireweed	72
Alumroot	49
Amelanchier	58
Amygdalaceae	60
Anaphalis	101
Androsace	82
Anemone	38, 39
Angelica	74
Antennaria	101
Apiaceae	74
Apocynum	83
Apple family	58
Aquilegia	42
Arabis	45, 46
Araceae	18
Aralia	72
Arbor vitae	16
Arctostaphylos	79
Arenaria	37
Arnica	102
Arum family	18
Aspen	30
Asphodel	19
Asplenium	5
Aster	98, 99
family	97
Asteraceae	97
Astragalus	62
Athyrium	6
Avens	57
Balsam root	101
Balsamorrhiza	101
Baneberry	41
Barberry family	43
Basket grass	19
Bean family	60
Bear grass	18
Bearberry	79
Beardtongue	87, 88
Bear-paw	19
Bedstraw	92
Berberis	43
Betula	31, 32
Birch	31, 32
Bistort	34
Bittersweet family	65
Bladder campion	37
Bladderwort family	92
Blanket flower	102
Blue flag	26
Bluebells of Scotland	96
Blueberry	82
family	80
Blue-eyed grass	26
Bog asphodel	19
orchis	26, 27
Borage family	85
Boraginaceae	85
Botrychium	5
Bracken	7
Brassicaceae	44
Bronze bells	20
Brown-eyed Susan	102
Buckthorn	66
Buckwheat family	33
Buffalo berry	70
Bunchberry	75
Bursa	44
Buttercup	41
Butterfly lily	22
Butterwort	92
California lilac	67
Calochortus	22

	Page
Calypso	28
Camas	22
poison	21
Campanula	96
Campion	37
Candytuft, wild	45
Caprifoliaceae	93
Carex	17
Carpenter weed	86
Carpet pink	36
Caryophyllaceae	36
Cascara sagrada	67
Castilleja	89, 90
Catchfly	37
Ceanothus	67
Cedar	17
giant	16
Celastrus	65
Cerastium	37
Cheilanthes	5
Cheirinia	45
Cherry	60
Chickweed	37
Chicory family	96
Chimaphila	76
Chokecherry	60
Cichoriaceae	96
Cinquefoil	55, 56
Cirsium	104
Claytonia	35, 36
Clematis	40
Clintonia	23
Clover	61
Club moss	8, 9
Coltsfoot	102
Columbine	42
Compositae	96, 97
Corallorhiza	29
Coralroot	29
Cornus	74, 75
Corpse plant	77
Cotton grass	17
Cottonweed	72
Cottonwood	30
Cow parsnip	74
Cranberry	81
highbush	93
Crassulaceae	47
Crataegus	59
Crowfoot family	38
Cruciferae	44
Cryptogramma	5, 7
Currant	53
Cyperaceae	17
Cypripedium	26
Cystopteris	5
Cytherea	28
Dandelion	96, 97
Deerbrush	67
Delphinium	43
Devil's-club	73
Dionaea	46
Disporum	24
Dock	33
Dodecatheon	82
Dogbane	83
Dog-tooth violet	22
Dogwood	74, 75
Douglas fir	15
Draba	45
Drosera	46
Dryad	57
Dryas	57
Dryopteris	5, 6
Echinopanax	73
Elaeagnus	70
Elderberry	95
Elephant-head	91
Epilobium	71, 72
Equisetum	9
Erica	80
Ericaceae	78
Erigeron	99, 100
Eriogonum	34, 35
Eriophorum	17
Erythronium	21
Evening primrose family	71
Everlasting	101
Fabaceae	60
Fairy bells	24
Fan weed	45
Ferns	5
Figwort family	87
Filix	5
Fir	14
Douglas	15
Fireweed	71, 72
Flag, blue	26
Flax	65
Fleabane	99, 100
Forget-me-not	85
Fragaria	56
Gaillardia	102
Galium	92

	Page
Gaultheria	79
Gaylussacia	80
Gentian	83
Gentiana	83
Geranium	64, 65
Geum	57
Ghost flower	77
Giant cedar	16
Ginseng	72
Glacier lily	21
Globeflower	43
Glycyrrhiza	63
Goldenrod	98
Goodyera	28
Gooseberry	53
Grape fern	5
Grass family	17
Grossularia	53
Ground cedar	9
pine	8
Habenaria	26, 27
Harebell	96
Hawkweed	97
Hawthorn	59
Heal-all	86
Heath family	78
Heather	80
Hedysarum	63, 64
Heliotrope, wild	96
Hellebore, false	20
Hemieva	50
Hemlock	15
Heracleum	74
Heuchera	49
Hieracium	97
Highbush cranberry	93
Hollyhock, wild	68
Honeysuckle	93
swamp	95
Horsemint	87
Horsetail family	9
Huckleberry	80
Hydrophyllaceae	84
Hypericum	68
Hypopitys	77
Ibidium	27
Indian paintbrush	89, 90
pipe	77
tobacco	101
warrior	90
Iridaceae	26
Iris	26
Jacob's-ladder	84
Jim Hill weed	45
June berry	58
Juniper	16
Juniperus	16, 17
Kalmia	79
Kinnikinnick	80
Labiatae	86
Labrador tea	78
Lace flower	49
Ladies'-tresses	27
Lady fern	6
Lady's-slipper	26
Lappula	85
Larch	13, 14
Larix	13, 14
Larkspur	43
Lathyrus	64
Laurel	79
Ledum	78
Leguminosae	60
Lepargyrea	70
Lepidium	44
Leptarrhena	53
Licorice	63
Lilac, California	67
Liliaceae	18
Lily family	18
Limber pine	13
Linnaea	94
Linum	65
Listera	27
Loco weed	62, 63
Lodgepole pine	12
Lonicera	94, 95
Loranthaceae	33
Lousewort	91
Lupine	61
Lupinus	61
Lychnis	37
Lycopodium	8, 9
Lysichiton	18
Madder family	92
Maidenhair	7
Malaceae	58
Male fern	6
Mallow family	68
Malvaceae	68
Maple	66
Mariposa lily	22
Marshlocks	56
Meadow rue	40

	Page
Meadowsweet	54
Mentha	86
Menziesia	78
Milk vetch	62
Mimulus	88, 89
Mint	86
Mist maiden	85
Mistletoe family	33
Mitella	48
Miterwort	48
Monarda	87
Moneses	77
Monkey flower	88, 89
Monotropa	77
Moonwort	5
Mountain ash	59
lover	66
sorrel	33
spray	54
Mouse-ear chickweed	37
Mullein	87
Muskflower	89
Mustard family	44
Myosotis	85
Nettle	32
New Jersey tea	68
Ninebark	54
Nymphaea	38
Oak fern	5
Oleaster family	70
Onagraceae	71
Onion	22
Ophrys	27
Opulaster	54
Orchid family	26
Orchidaceae	26
Oregon grape	43
Oxyria	33
Oxytropis	62, 63
Pachystima	66
Paintbrush, Indian	89, 90
Panax	72
Papaver	43
Paper birch	31
Parnassia	47, 48
Parsley family	74
fern	7
Parsnip	74
Pasque flower	39
Pathfinder	101
Pedicularis	90, 91
Pentstemon	87, 88
Peppergrass	44
Peppermint	86
Peramium	28
Petasites	102
Phacelia	84
Phegopteris	5
Phleum	17
Phlox family	84
Phoradendron	33
Phyllodoce	80
Picea	16
Piraceae	10
Pine	12, 13
family	10
Pinedrops	78
Pinesap	77
Pinguicula	92
Pink family	36
Pinus	12, 13
Pipsissewa	76
Plantain	28
Poaceae	17
Poison camas	21
Polemonium	84
Polygonaceae	33
Polygonum	34
Polypodiaceae	5
Polypodium	7
Polypody	7
family	5
Polystichum	5
Pond lily	38
Pondweed	17
Poppy	43
Populus	30
Potamogeton	17
Potentilla	55, 56
Prenanthes	97
Primrose family	82
Primulaceae	82
Prunella	86
Prunus	60
Pseudotsuga	15
Pteridium	7
Pteris	7
Pterospora	78
Pulsatilla	39
Pussy toes	101
Pyrola	75, 76, 77
Quaking aspen	30
Quamasia	22
Queencup	23

	Page
Radicula	44
Ragwort	103, 104
Ranunculaceae	38
Ranunculus	41
Raspberry	58
Rattlesnake plantain	28
Rattlesnake-root	97
Razoumofskya	33
Red whortleberry	81
Rhamnus	66
Rhubarb, sacred	74
Ribes	53
Rock cress	45, 46
Romanzoffia	85
Rosa	58
Rosaceae	54
Rose	58
family	54
Rubiaceae	92
Rubus	57, 58
Rumex	33
Running pine	9
Sacred rhubarb	74
St. John's-wort	68
Salicaceae	29
Salix	29
Sambucus	95
Sandwort	37
Sarsaparilla	72
Saxifraga	50, 51, 52
Saxifrage	50, 51, 52, 53
family	48
Scouring rush	9
Scrophulariaceae	87
Sedge family	17
Sedum	47
Self-heal	86
Senecio	103, 104
Sericotheca	54
Service berry	58
Shadbush	58
Sheep sorrel	33
Shepherdia	71
Shepherd's purse	44
Shooting-star	82
Shrubby cinquefoil	55
Silene	36, 37
Silver plant	34
Silverberry	70
Sisyrinchium	26
Skunk berry	95
cabbage	18
plant	84
Smelowskia	45
Smilacina	23
Snowberry	93
Solidago	98
Solomon's seal	23
Sophia	45
Sorbus	59
Sorrel	33
Spearmint	86
Speedwell	89
Sphaeralcea	68
Spiraea	54
Spiranthes	27
Spring beauty	35, 36
Spruce	16
Douglas	15
Squaw grass	19
Stellaria	37
Stenanthium	20
Stonecrop	47
Strawberry	56
bush	65
Streptopus	25
Sulphur plant	34
Sundew	46
Symphoricarpos	93
Tamarack	13
Tansy mustard	44
Taraxacum	96, 97
Taxaceae	9
Taxus	9
Thalictrum	40
Thimbleberry	57
Thistle	104
Thlaspi	45
Thuja	16
Tiarella	49
Timothy	17
Tobacco, Indian	101
Tofieldia	19
Trifolium	61
Trillium	25
Trollius	43
Tsuga	15
Twayblade	27
Twinberry	94, 95
Twinflower	94
Twisted-stalk	25
Umbrella plant	35
Urtica	32
Vacciniaceae	80
Vaccinium	81, 82
Vagnera	23

	Page
Valerian	96
Valeriana	96
Venus's flytrap	46
slipper	29
Veratrum	20
Verbascum	87
Veronica	89
Vetch	64
Vetchling	64
Viburnum	93
Vicia	64
Viola	69, 70
Violet	69, 70
Waahoo	65
Wake-robin	25
Wallflower	45
Water lily family	38
Waterleaf family	84
Whitlow grass	45
Whortleberry	81
Willow	29
Wintergreen	79
Witches' brooms	33
Wokas	38
Wood nymph	77
orchis	27
Woodsia	5
Xerophyllum	18
Yarrow	102
Yellow cress	44
Yew	9
Zygadenus	21

BINDING LIST DEC 15 1951

525898

Standley, Paul Carpenter
Plants of Glacier national park.

BoF
S

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
LOWE-MARTIN CO. LIMITED